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"THE NORTH DAKOTA FARMER FOR NORTH DAKOTA FARMERS"

Vol. 13 · No. 9

Lisbon, North Dakota, March 15, 1912

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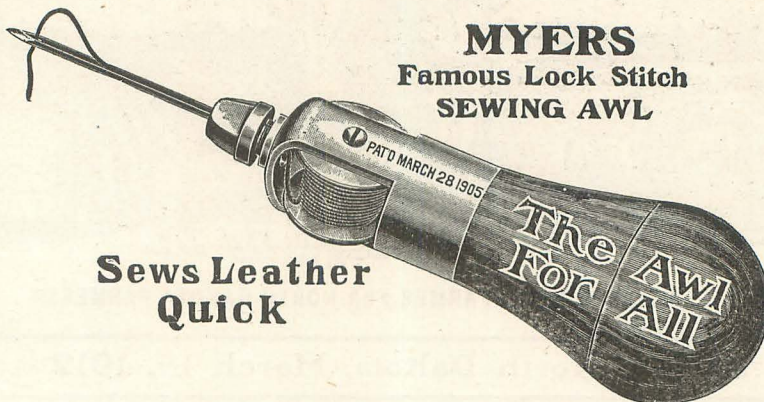
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# THE NORTH DAKOTA FARMER

Vol. 13, No. 9

LISBON N. D., MARCH 15, 1912

50 Cents a Year

## Better Farming Association of North Dakota

The Better Farming Association of North Dakota is a corporation formed by business men of the state and of Minnesota, who believe that unless a change was made in the methods of farming that have been practiced, their future business would be seriously impaired. They realized the fact that all states basing their agriculture upon essentially a one crop system, sooner or later, thru the partial exhaustion of the fertility of the soil and the consequent economic ills, passed thru a period of agricultural depression. This period of depression was more or less severe, depending upon the length of time it took the farmers to readjust their business to the new methods demanded in the production of livestock and the diversification of their industry. Practically all of our central-western states have passed thru this condition.

With the experience and the agricultural knowledge that is now in existence, it is believed that material assistance can be given to the individual farmer who is ready to change from the single crop system of agriculture, or to adopt better methods. During this transition period men can be helped to the greatest advantage by demonstrating the methods which have previously been found helpful. The Association with its agricultural and livestock experts will establish a number of demonstration fields and plats, show methods of livestock production and of other like subjects which will aid the farmer in increasing his profits.

The method adopted for developing the work and carrying out the purposes of the organization will be thru direct contact with the individual. A number of practical, as well as technically trained men will be employed to carry to the individual wishing assistance the results of research and the best experience of practical farmers. These experts

will aid the farmer in applying and making practical use of this knowledge on his own farm. They are to be stationed in certain counties and districts and they will be expected to assist, so far as possible, the various individuals in their districts to adopt methods which will be more profitable. The Association is desirous that these experts be made full use of. Their services are free, and all that is asked is that when suggestions are made which can be properly applied, that they be adopted and used.

The theory of the work, and it has been practically worked out in certain states, is that the farmer can gain a great deal of light upon his business and upon methods of tillage, cultivation, seeds and livestock products by going over these various matters with a man who is competent to show him how new methods may be applied and adopted on his own farm. Many of these methods have been well worked out and are thoroughly demonstrated. It is not the object of the Association at this time to bring to the people of the state a great number of new things, but to bring to them individually those matters which can now be taken up with profit.

### Kinds of Work

Several rather definite forms of work will be undertaken in order to bring these objects to the attention of communities. They may briefly be classified under five heads, each of which has for its object the presentation of certain well known facts.

### Demonstration Plats and Fields

The demonstration plats or fields are planned to show definitely the results of a certain rotation or of tillage and seeding methods. These demonstrations will be co-operative. It is expected that the farmer who cooperates in this work will furnish the use of his land free and will do the work upon it as laid out by the supervisor. All crops and all products raised

on this land will belong to the farmer. Each co-operator will agree to follow plans and methods as given him by the county supervisor. The work will embrace two distinct lines.

**First, demonstration fields**, comprising an acre or more on which definite instructions will be given as to how certain crops shall be raised or certain tillage methods applied. On these fields, the method of producing crops which will be of economic importance to the locality will be shown. Especial attention will be paid to the alfalfa, clover and corn crops, winter wheat, rye and the production of superior varieties of the common grains. The crops best grown in any vicinity will depend upon soil, climatic and economic conditions.

**Second, demonstration plats**, a number of which, ranging from five to twenty acres, or even more, will be established in each vicinity. These plats will be designed especially to illustrate proper systems of rotation which will enable the farmer to secure larger yields and at the same time, keep up the fertility of his soil. This is of the utmost importance. Sooner or later definite rotations of crops must be used in all sections of the state. These plats will illustrate the rotation that is believed to be best adapted to the particular conditions existing in the locality. In addition to the rotation and its effect in securing an increased crop yield, definite instruction will be given in regard to tillage and cultural methods and the use of manures, grass crops, and possibly in some sections, commercial fertilizers.

**Requirements:** Demonstration fields will be established in cooperation with any farmer in the district who will follow the instructions as given him. This work extends over a period of one year only, but can be made of great assistance. Farmers accepting such work will be visited as often as necessary and will be expected to make a brief report at the close of the year of the results secured.

Farmers who co-operate on the demonstration plats will be expected to follow instructions given for a period varying from three to five years. These plats to be of value must be carried on for a period of time and instructions must be definitely followed. *The results of these fields and*



rotations are to be used to illustrate the advantages that may easily accrue to the farm from such methods. It is expected that each field man will be able to co-operate with fifteen or twenty farmers in developing this class of work.

#### Demonstration Farms

The Association will begin a few co-operative demonstrations with the farm as a unit, the farmer agreeing to follow instructions as to the operation of his entire farm, and as to the feeding, care and management of his livestock. Only a few farmers can be cooperated with along this line, which represents the highest and most complete form of demonstration work and will only be attempted with men who are ready to accept and put into practice the instructions given.

The requirements are: (1) Farm so located as to be easy of access. (2) Farmer must operate his own land. (3) Agree to cooperate for a period greater than three years. (4) Farm must be representative of conditions such as prevail in the vicinity. (5) Farm must be either already stocked or farmer prepared to stock it. The Association will give expert advice in assisting to properly develop this farm so that it will be most profitable. This phase of the work offers a splendid opportunity to a few farmers desirous of increasing their profits and of demonstrating in a community the results of proper methods of management.

#### Livestock Demonstrations

The development of production of livestock products is one of the most necessary features of the agricultural situation in the state. Until farmers generally see the great possibilities which lie in dairying, beef, hog, sheep and poultry raising, and the relationship which these various classes of livestock bear to profitable farming, little can be done to make permanent the agricultural prosperity of the state. It is planned to devote a considerable part of the experts' time to assisting and instructing individual farmers in solving or in developing their livestock problems. It is desired to assist and instruct farmers in the care, selection, breeding and feeding of all classes of livestock. Definite information and instruction can be given in regard to the use of feeds, and the making of a balanced ration. Often very marked results in increased production can be secured thru proper feeding. Farmers interested in grading their herds for greater production will find that the Association experts can be of great assistance to them. Often-times definite help can be given a community in securing proper sires or in obtaining foundation stock. These men can be of the greatest value to those farmers wishing to make their future more profitable. Certain simple reports, in regard to production, in-

come and expense, will be required from the co-operators. The experts will visit and assist the co-operators as often as necessary. This may be from fifteen to thirty times a year.

#### Advisory Farm Management

Marked improvements may be made in the operation of almost every farm. Many farms are not properly planned, buildings are not well arranged, rotations are not adopted, and the class of livestock used, or the lack of livestock, may make the farm relatively unprofitable. The experts located in the county can be of the most value to farmers of the county when they will call upon them for definite assistance along certain lines. It is hoped that ultimately the farmers will find that the services of this man are so valuable in helping them to solve their own farm problems that they will make full use of his time. The farmers of each district are entitled to call on these field men and to obtain their assistance and instruction in the various problems that affect their profits or their home life. A great many matters will naturally be taken up under this head. A few suggestions as to the phase of work upon which assistance can be given, include the following:

- (a) Specific help in soil management.
- (b) Planning of the farm as to certain systems of rotation.
- (c) Fencing, types of fences used, and methods. It is highly important that before permanent fencing is done the farm plans should be carefully decided upon. This is an individual problem on practically every farm.
- (d) Relation of livestock to the farm—the investment which should be made, the breeds used, assistance in purchase and selection and the best class of stock to use for specific conditions.
- (e) Various forms of building construction, barns, silos, sanitary conveniences, etc.
- (f) Drainage.
- (g) Seed selection, seed curing, special cultural methods and crops.

Work of the character outlined above and that with livestock are the most important lines of work that the Association can take up. It is hoped that the co-operators will make full use of the men along these various lines.

**Farm Accounts:** The main office will keep accounts for a limited number of farmers, covering a field, a single enterprise, or the entire farm. A report showing cost and income will be rendered to the cooperating farmers monthly. All accounts and records used with cooperating farmers will be kept at the general offices of the Association and reports made regularly at no cost to the farmer. It is recognized that the lack of knowledge upon the part of the farmer as to cost and income has often been responsible for

lack of interest in the business side of the farm, which encouraged the use of poor methods. This data will only be used publicly with the consent of the cooperative farmers.

The requirements are: (1) Farmer must agree to report regularly thru-out year or season on simple data sheets furnished by the Association. (2) He must pay postage on reports and data sheets, which will amount to \$4 per year, payable at the rate of \$2 every six months in advance. The books kept will be simple but accurate. Needless to state, only a few farms can be handled under these conditions.

#### Literature

From time to time bulletins and circulars containing information which it is believed should be brought to the attention of our co-operators and farming public will be issued. This matter will treat of various subjects which are of immediate interest to the public, and will be so prepared that it can be made of the greatest use. This literature will be distributed only to those making application for them.

#### Conclusion

Many details will be developed under the various heads, all of which will have for their purpose the calling of attention to the various factors which will increase the farmers' profits. It is the purpose of all of this work to deal directly with the individual and to assist him in developing the methods which are applicable to his own conditions. The supervisor or his assistant will constantly be accessible to the individual and ready to assist those cooperating with him or calling upon him for assistance. These men belong to the community and can be of the most value when the greatest number of individuals call upon them for help. In addition to the various methods as outlined previously, it is expected that attention will be paid to the social side of farm life. Better farming clubs will be formed in as many townships and districts as possible. During the winter months lectures in school houses will be held thru these various clubs for the purpose of bringing before them matters which are of educational and community interest. The Association co-operates closely with the North Dakota Agricultural College and with the United States Department of Agriculture. The organization has engaged in this work solely for the benefit of the state. It is here to be made use of by the people and is anxious to give its services to all who can make use of them, thus assisting in the great educational movements that have had for their purpose the making of a more efficient country life and of increasing the productiveness and profitableness of the farms of the state.



## ECHOES FROM THE TRI-STATE CONVENTION

### ALFALFA IN NORTH DAKOTA

By L. R. Waldron

There is no reason to doubt but what alfalfa will play a very important part in the agriculture of North Dakota, as it has already in Kansas and Nebraska. There are many difficulties in the way of developing a large acreage in North Dakota, but these difficulties can scarcely prevent the ultimate attainment of results. One of these difficulties is the securing of proper seed.

We have been told that the way to raise alfalfa is simply to sow the seed. It is not a simple matter to obtain the seed to sow—seed that is suitable for our conditions. Alfalfa is naturally a hot weather plant, but varieties have been produced that will endure the cold of North Dakota. The seed of such varieties is comparatively scarce and it is an important matter for us to consider the subject of alfalfa seed production.

#### Southern Seed Tender

It has been found repeatedly that alfalfa seed brought from sources of its most abundant production, from the states of Colorado, Utah and California, is unsuccessful when sown in North Dakota, so much so that often scarcely a half or a fourth of the first year's seedling will persist thru the first winter. Even seed brought from Montana is not at all certain in hardiness. It must be remembered that the alfalfa seed in Montana is produced in the winter wheat regions. If winter wheat will live thru in the winter wheat section of Montana, but will not in North Dakota it is easy to believe that the alfalfa that persists in Montana may not persist in North Dakota and this is oftentimes found to be true.

"It is illogical to consider Montana, Colorado or any other state as the natural source of alfalfa seed for this state. North Dakota should grow its own alfalfa seed. When the alfalfa acreage of North Dakota has increased so that our farming methods are upon a rational basis, so that our agriculture is built upon a permanent foundation, then the alfalfa acreage will approximate 3,000,000. But this apparently large acreage would mean only about fifteen acres upon each quarter section of arable land, none too much for the crop making the best hay on earth.

#### Present Acreage

The present acreage in North Dakota is quite unknown, but it certainly is not above 3,000. It is seen at once that it will require several years to work up to the desired acreage, and it

will require also a large quantity of seed, even to increase the acreage as rapidly as is desired.

I wish to take an optimistic view of the future agriculture of North Dakota and to do this, let me assume that in the course of the next ten or fifteen years, the alfalfa acreage in the state will increase a thousand-fold. To sow such an area would require some 24,000,000 pounds of seed. Assuming a yield of 200 pounds per acre, it would require 120,000 acres to produce the required amount of seed.

Fortunately this amount of seed does not have to be produced at once, but it needs to be produced as rapidly as possible in order to keep anywhere near the demand. I am giving you these figures in an effort to impress upon you the seriousness of the alfalfa seed proposition at the present time. I might mention that often one makes a "strike" in alfalfa seed production. Mr. Brevig of McKenzie county, for instance, raised four bushels of Grimm seed from one-half acre in 1911. This would easily sell at the rate of \$144 per acre.

#### Outside Demand

North Dakota is not the only state that is making an effort to secure hardy seed. It has been found that certain strains of alfalfa, particularly the Grimm, succeed better in the north central and in the north Atlantic states than other alfalfas. Thus the states east from North Dakota, to the Atlantic ocean, as far south as Pennsylvania, Ohio and Indiana are desirous of securing northern grown alfalfa seed of hardy strains.

The alfalfa plant is peculiar in producing seed, it requires special conditions. It is the real business of the alfalfa plant to produce hay. The production of seed is a necessary evil. The primary production has been hay for so many thousands of years, and seed only secondary, that special conditions are necessary for seed production. This long time production of seed under dry atmospheric conditions has perhaps become inbred thus limiting seed production in humid areas. Whatever the reason, the fact is, seed production is not successful ordinarily in such states as Illinois, Pennsylvania or Vermont.

#### Value of Alfalfa

Perhaps I should not have mentioned this outside demand for alfalfa seed, for it is the local demand that is of the very greatest importance in this state. If North Dakota were ruled by an absolute king I would expect him

to publish a decree forbidding the export of any hardy alfalfa seed from the state until the farmers were amply supplied.

We must not forget what alfalfa is for. Alfalfa is a food for our poultry. It is to be fed to young and maturing hogs to make them grow cheaply so that they can be given an economical finish with corn and small grains. Alfalfa is to be fed to growing stock and to colts, and alfalfa is to be fed as hay to horses; but over and above all, alfalfa is to be fed to milch cows to produce milk—this is to be the greatest function of alfalfa in North Dakota.

#### Hardiness Essential

The first essential for North Dakota grown alfalfa seed is undoubtedly hardiness. It lies in the power of the North Dakota farmer to break up any hardy alfalfa seed trust that may be in existence. The Dickinson station has already co-operated with nearly forty farmers in the growing of Grimm alfalfa in cultivated rows for seed production. It is expected that future co-operation will be entered into this coming spring. Explicit instructions are sent out with the seed for sowing and taking care of the crop. The small tracts scattered over the state will form a leavening influence serving to put the alfalfa seed industry within the hand of the farmers.

#### Pure Seed Associations

As the farmers of the state begin to grow their own seed, it will be to their great advantage to form pure seed associations. Such associations would not be entirely unlike the Holstein Breeding circuit, established at New Salem, N. D. The members of the association would of course have to abide by the rules agreed upon by all. The association would sell its seed direct to the consumer, thereby doing away with the profits of the middleman. The association would guarantee the quality and purity of the seed and would thus be enabled to command good prices. In this way the purity and genuineness of the strains would be preserved. In addition to hardiness, the time will soon come when other characteristics will be looked for in alfalfa seed.

#### Points for Breeding

There are three remarkable things about alfalfa: (1) its high yields; (2) its wide range of adaptability; and (3) its high protein contents. It is the protein in alfalfa that produces the increased milk flow and gives such wonderful results in growing animals. We are already beginning to breed alfalfa for other characteristics than hardiness. In the first place we want to increase the quality of the plant for hay and this may be done by selecting out the best type of hay plant and propagating it. Such a plant must be leafy, reasonably succulent, and disease re-



sistant. Alfalfa must be bred for its protein contents, the high protein contents to be combined with the maxima of other desirable qualities. It would be valuable to breed a hardy alfalfa that would be known by some seed characteristic.

Professor Thos. Shaw, in charge of the 51 demonstration stations conducted by the Great Northern and Northern Pacific railroads in the Dakotas and in Montana, addressed the Convention on the subject, "The Elements of Success in Agriculture." He began by saying, that while in the abstract these elements were many, they could usually be included under five distinct heads. These are as follows: (1) The farmer must recognize the conditions amid which he labors. (2) He must adopt some system of crop rotation. (3) He must maintain producing power in his land. (4) He must cut down all waste to a minimum, and (5) He must follow some system that will find him employment all the year.

The conditions that should determine in great part at least the kind of farming that should be followed, are such as relate to soil, climate and markets. The crops should be given the right of way that will give the largest cash returns under the conditions of soil, climate and markets taken together that may be present. This means that at the present time under the conditions that exist in the Dakotas, wheat and flax should be given the right of way among cereals. This does not mean that other cereals should not be grown, but that when grown they should be made subservient to the growing of wheat and flax by feeding them to livestock and putting the manure resulting on the land. Violence should not be done to existing conditions. Corn tho extensively grown should be fed mainly without husking. Clover tho very valuable where it can be grown successfully, should not be sown extensively on the dry lands of the western Dakotas, but alfalfa should be sown in its stead, whereas clover may be greatly profitable in the Red River Valley. Where the rainfall is not more than 15 inches in a year, farming cannot be successfully done unless due regard is given the methods that conserve moisture in the soil.

Without some wise system of rotation, the producing power of the land cannot be maintained.

Growing one crop continuously and selling it, will reduce the producing power in the land as sure as the sun shines in the sky. It will reduce it by removing more or less of its fertility, by promoting increase in weed growth, by removing humus and by favoring the increase of fungous diseases and of damaging insect life. The evil day may be long deferred as it has been in some of the rich soils of Dakota, but in all of these, however rich, it will surely come at length.

By summer-fallowing and growing corn, weeds may be kept at bay, but these operations will not give humus to the land. That can only be done by putting vegetable matter into it, and the lost fertility can only be restored by applying to the soil farm or artificial fertilizers, the former including legumes.

To maintain producing power in the land, an equivalent must be put back onto the land equal to what has been removed from it as previously intimated. This equivalent can best be put back again under Dakota conditions at the present time by growing legumes and keeping livestock. The best all-round legume that can be grown at the present time is alfalfa, but peas may also aid materially and also clover in the central and eastern portions of the state. It is questionable if the application of commercial fertilizers will pay at the present time on average soils, but it may be different in the future.

The waste in the Dakotas in many instances is not only prodigal, but sinfully so. It is seen in the burning of straw, in the great waste of ungathered heads in the stubbles and in the crops that are planted so late that they are destroyed by frosts. At the present time grain worth millions is lying under the snow, a waste nearly all of which could have been

avoided. It could have been avoided by timely sowing, timely stacking, and timely threshing. The evil of those tremendous threshing outfits must be removed. Small machines owned and controlled by three or four farmers are wanted, in order to thresh all the grain on time, and where this cannot be done it ought to be put into stacks.

If the farmer is to follow some system that will give him employment all the year, he must do something else besides growing grain. He must keep that amount of livestock on his farm that will consume all the coarse grains and roughage grown on the farm, and that will turn to good account all the straw. This will furnish profitable employment all the season thru, for the farmer and his family. While engaged in caring for the livestock in winter farmers will be employed in turning products of limited value into products of higher value, and they will in this way increase their revenues. The work need not of necessity be laborious. It will also favor the maintenance of moral stamina in a sturdy peasantry and also in their growing up sons and daughters. One of the greatest hazards that threatens the agriculture of the Northwest is the long season of enforced idleness that comes to grain growing farmers.

## EXTENSION DEPARTMENT

W. C. Palmer, Agricultural Editor

### GETTING TO WORK

The North Dakota Better Farming Association secures high grade men for field work. The following men are already in the state and at work:

Mr. Chris Schroder comes from the Wisconsin Agriculturist of which paper he has been assistant editor. After graduation from the Wisconsin College of Agriculture he came to the Minnesota College of Agriculture as Assistant in Animal Husbandry. He was raised on a stock farm in Wisconsin, and was stock feeder at the Wisconsin Experiment Station and has had much practical work on the farm. This, coupled with this thoro training in agriculture, makes him a very valuable man.

Th. T. Kristjanson has for the last two years been manager of the McLeod North Dakota Demonstration Farm. His success has been very marked. He is a graduate of the Farm Husbandry Course, North Dakota Agricultural College. After graduation he went back to farm, his success resulted in being selected for running the demonstration farm.

Edwin Mayland comes from the Cokato, Minn. High School, where he served as

agriculturist. In addition to teaching he held meetings for the farmers over the county and did farm to farm work; rapid improvements came as a result of this work. He is a graduate of the Minnesota College of Agriculture and has spent one year on the Northfield Statistical route.

W. R. Lanxon, Supt. of the Hettinger Substation, received his education at the North Dakota Agricultural College, where he also served as assistant in Animal Husbandry. He fed the steer that was reserve grand champion at the 1906 International Fat Stock Show. He has managed farms in the state and for two years had charge of Mr. Sanford's herd of black polls, making the fair circuit with them and winning more than his share of the prizes. He also served as agriculturist at the Alexandria, Minnesota High School for one year.

M. B. Johnson, for two years' assistant superintendent North Dakota Demonstration Farms, is a graduate of the Farm Husbandry Course, North Dakota Agricultural College. After graduation he went back to the farm which he was called to the demonstration farm work.

A. F. Bochert has been engaged in farming in central Minnesota. He is a gradu-



ate of the Minnesota College of Agriculture. He has a wide farm and business experience.

J. V. Bopp comes from the Northwest Farmstead, of which paper he was associate editor. He is a graduate of the Illinois College of Agriculture. After graduation he was called to the South Dakota Agricultural College as associate professor of agriculture. As he is familiar with conditions in the Northwest.

Mr. Thomas Cooper, Secretary and Manager of the Better Farming Association, has certainly done well to secure so many men and so well qualified for the work in hand. The men who can do field work in agriculture are very scarce. He has had to take all these men out of good positions. He, however, needs five more men in order to start the work off as planned. He is scouring the country in search of these additional workers.

This is the first instance in history that bankers or any other set of men have started and financed a practical state wide campaign in agricultural education.

The training and experience of the men employed promises much in the way of results.

#### RUSSIAN THISTLE

Russian thistle is one of the persistent weeds in a dry year. It has some merits, however. Feeders, who have made it into hay when green, have found that stock like it and that they do well on it. Prof. E. F. Ladd of the North Dakota Agricultural College analyzed the thistle specimens that were well grown, but not ripe, and found they had the following composition:

	Russian Thistle	Alfalfa
Moisture.....	5.81	9.15
Ash.....	15.87	8.67
Crude Fat.....	2.96	5.96
Crude Protein.....	18.25	17.81
Crude Fiber.....	25.04	19.46
N-free extract.....	32.07	38.95—

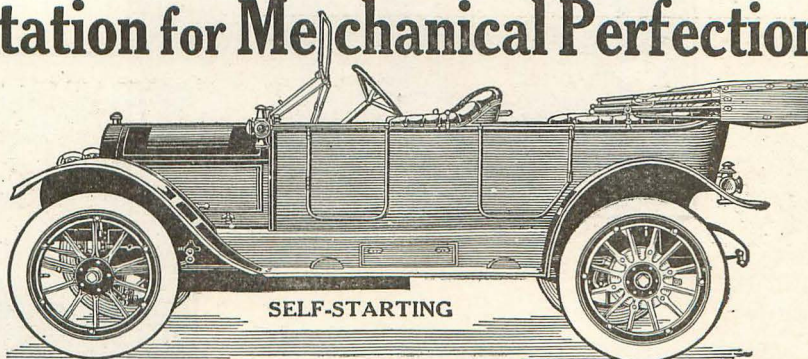
The thistle is practically the same as alfalfa. This accounts for the good results that feeders have secured in feeding Russian thistle hay.

The Russian thistle is most abundant in dry years and that is the time that fodder is most apt to be scarce. The Russian thistle could be made into hay at such times to good advantage.

#### DEMONSTRATION FARM REPORT

The report of the North Dakota Demonstration farms for 1910 is from the press.

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has Case Cars on exhibition. Carries full line of supplies and has every facility for taking care of Case Cars.



J. I. CASE T. M. CO., Incorporated, Dept. 64, Racine, Wis.





A separate report is made of each of the 24 farms. The summer of 1910 was exceedingly dry, making it a good tester of methods. The value of corn as a preparation for the growing of wheat is most emphatically made. At Hoople the wheat after wheat went 8 bushels per acre. The plot next to it that had been cropped the same except that it was in corn the year before went 19 bushels. At Rugby the wheat after corn went 10 bushels per acre while wheat after grain went but two and one-half.

### ROADS AND THEIR IMPROVEMENT

Even with a high-powered automobile that could keep up a pace of 90 miles a day indefinitely, it would take a man more than 65 years to cover all the public roads in the United States. A young man of twenty starting out to accomplish this tremendous task would be 85 before he had covered the last mile of public highway in this country.

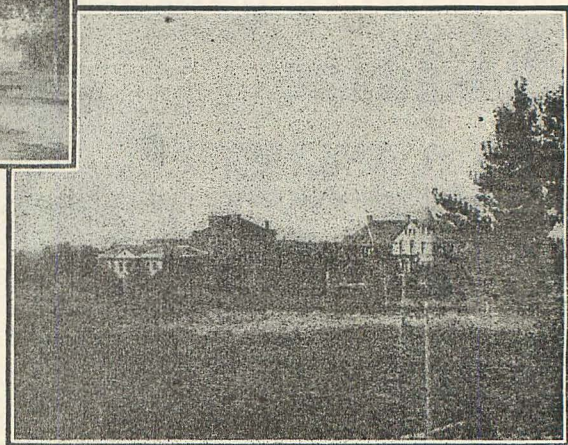
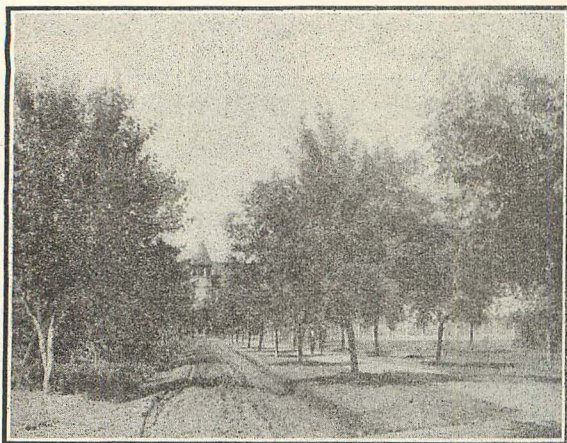
After an investigation extending over many months, Logan Waller Page, Di-

rector of the Office of Public Roads, be of some other substance, while exaggerations were eliminated.

"The total mileage of sand-clay, brick, bituminous-macadam and other improved roads in 1904 was 6,806, while in 1909 the mileage reached 28,372."

The Office of Public Roads has just issued a table showing the states having the largest mileage of improved roads:

	1904	1909
Indiana	23,877	24,955
Ohio	23,360	24,106
New York	5,876	12,787



Two Views at the North Dakota Experiment Station, Fargo, N. D.

At harvest time 1910 the moisture to a depth of three feet in the corn field was 16 per cent; in the wheat field eleven and one-half per cent; in the oat field, eight and one-half; barley field, thirteen and three-quarters; peas and oats field, nine and one-half and in the flax field, fifteen and one-half. In 1909, a wet season, the moisture at harvest time was seventeen and one-half per cent in the corn field to a depth of three feet. In the wheat field it was thirteen and three-quarters; oat field, twelve and three-quarters; barley, seventeen and three quarters; oats and peas, fourteen and three quarters; flax, sixteen and one-quarter. In 1908 the corresponding figures were: corn, eighteen and three-quarters; wheat, thirteen and one-quarter; oats fourteen and one-half; barley fifteen; peas and oats eleven and flax ten and one-half.

The report contains 166 pages and is illustrated. It can be had on request to the Experiment Station, Agricultural College, N. D.

North Dakota Farmer: Fifty Cents a year; 3 yrs., \$1.00. Agents wanted.

rector of the Office of Public Roads, has ascertained that there are now 2,199,645 miles of public roads in the United States. The figures include all the new roads built up to the year 1909. In 1904 there were exactly 2,151,379. It is apparent, therefore, that the increased mileage of new roads within a period of about five years has been 48,266.

"The investigation just concluded," said Director Page, in an interview, "shows conclusively that the movement for the improvement of public highways has obtained a firm grip on the country. The percentage of roads which were really improved, amounted to 7.14 in 1904, while in 1909, to which year statistics are now available, the percentage was 8.66.

"It is interesting to observe the growth of improved methods in road construction. For instance, the total mileage of stone roads in 1904 was 36,818, while in 1909 it was 59,237. The total mileage of gravel roads in 1904 was 109,905, while in 1909 it was only 102,870. This decrease in gravel roads, however, was due to a re-classification of roads. Many of those reported in 1904 to be of gravel proved to

Wisconsin	10,633	10,167
Kentucky	9,486	10,114
Illinois	7,924	8,914
California	8,803	8,587
Massachusetts	7,843	8,463

### HOW TO KILL QUACK GRASS

The Department of Agriculture has recently issued Farmers' Bulletin No. 464 on "The Eradication of Quack Grass." Quack grass is well known to most farmers all the way from the Atlantic to the Pacific in latitudes north of the Ohio and Potomac Rivers. It is one of the most serious weed pests known in America. The grass grows under a great many different names, among them couch grass, witch grass, and twitch grass.

The author of this bulletin has spent a number of years making a close study of the grass under field conditions all over the northern United States. Based on this thoro knowledge of the field habits of the grass, experimental work was started, which quickly resulted in a complete,



cheap, and practical method of eradicating the pest.

Farmers' Bulletin 464 embodying this work can be had by applying to your Senator, Congressman, or directly to the Department of Agriculture at Washington.

#### A Valuable Seed Catalogue.

No matter where you plan buying your seeds, you should be sure to write to Northrup, King & Co., 709 Bridge Sq., Minneapolis, for their large, beautiful 1912 catalogue. For 28 years this house has been selling the best seeds obtainable. Their seeds are sold by over 12,000 dealers.

### QUERIES and ANSWERS

To the North Dakota Farmer.

I have two fields, one was planted with corn last season the other with timothy and plowed right after the hay was taken from the field. I want to sow one with flax, which one would you prefer?

Neither one of the pieces of land has been cropped with flax for a number of years.

I would like to put in system a six years' rotation but do not know which one of the two systems, named below, to choose:

#### First System

First year, grass; second year, flax; third year oats; fourth year, corn; fifth year, wheat; sixth year, barley.

#### Second System

First year, grass; second year, corn; third year, flax; fourth year, wheat; fifth year, oats; sixth year, barley

I find the men coming to North Dakota to help to harvest and thresh; so many of them, have the habit of playing cards (gamble). I don't like that and would like to find a good effective way of stopping that, also, all smoking everywhere there is any danger of fire.

If you can solve those questions for me I would be very thankful.  
Shawnee, N. D.

J. P. H.

Answered by Prof. Shepperd

In answer to J. P. H. I would say that flax will probably be most satisfactory to



ANTON MICKELSON  
President

## Don't Let Gophers Rob You This Year

The gophers and squirrels are now sleeping and dreaming of what great feasts they will have as soon as you start your spring seeding. As soon as the snow disappears, they will wake up from their long sleep and join together for the big feast of grain that the farmer will be spreading and which he believes will produce bounteous crops for him. The gophers *didn't last year and the year before and they can't figure out any reason why they won't be able to do it again.* Yet the whole matter is in your hands, Mr. Farmer. Are you going to stand a loss of \$200 every 80 acres, or are you going to prevent this loss?

## 1c PER ACRE KILLS THEM

I want to prove it to you—I want to show you how a 75c box of Kill-Em-Quick—my gopher poison—will kill every gopher on an 80-acre farm—how a \$1.25 box will kill them all on a 160-acre farm. Is it worth while to you to at least investigate and get the facts? Let me prove to you that every gopher on your farm costs you 10c—that there are about a thousand gophers on a 40-acre field—that in 40 acres the gophers will eat and store away hundreds of bushels of grain. Why not get a package of

### MICKELSON'S KILL-EM-QUICK GOPHER POISON

from your druggist right away? Have it on hand ready. It is easy to use. The first day you see any signs of a gopher mix a little Kill-Em-Quick, carry it out in the field and put it wherever you know a gopher has been. Go back in a few minutes and if the gopher remained around there you will find him *dead*.

Mickelson's Kill-Em-Quick has a very peculiar odor and a very attractive taste to gophers. It draws them like a magnet and they eat it greedily. One single poisoned grain is enough to kill a gopher. It is the most economical and the quickest acting gopher poison ever placed on the market. It also kills pocket-gophers, field mice and squirrels.

I know what it has done thousands of times on thousands of farms throughout the country. That is why I can absolutely *guarantee* it to give positive and perfect satisfaction to you, or I, personally, will refund every cent of your money. Go to your druggist. It will even pay you to make a special trip. Get a package of Kill-Em-Quick. If he won't supply you, send me his name with your order and I'll ship direct, express prepaid—and with my guarantee of satisfaction or money back.

#### WRITE ME A POSTAL OR LETTER

I have made a special study of gophers and I want to tell you some of the things I've learned about them. I want to tell you personally how you can rid your fields of them. But if you follow the simple directions given on every package of Kill-Em-Quick you will find it an easy matter to kill every gopher on your farm. Tell me whether you have gophers, squirrels, prairie dogs, field mice, rats or pocket-gophers to contend with. I will tell you the best way to use Kill-Em-Quick. Write me now, and in the meantime go to your druggist and get a 75c package of Mickelson's Kill-Em-Quick. Don't take anything else. Nothing else on the market will do the work as quickly or as cheaply.

Address me personally—

ANTON MICKELSON, President, Mickelson Kill-Em-Quick Company  
1429 Washington Ave., North, MINNEAPOLIS, MINN.



## FARGO FOUNDRY CO., Fargo, N. D.

The Largest Foundry Machine Shop and Boiler Shop in the Northwest. A large stock of Structural Steel and Iron always on hand. Full Line of Blacksmith Tools for Farm use. The Biggest plant in the Biggest Little City in the world. Nothing too large or too small for us to tackle in Power, Building, or Machinery. Best Tools and Skilled Workmen is the secret of our success. While in our city call and see us and judge for Yourself.

End of North Bridge, N. P. Ave.



him on the timothy sod altho the corn land should grow good flax. The corn ground will give better results in proportion for some other cereal than the sod land while the sod will be nearly to quite as good for flax, varying somewhat according to the season.

I think J. P. H. will find better results coming from his first plan of cropping than from the second one.

I do not know how to successfully keep hired men from playing cards and smoking. Moral suasion is all I can suggest. Reasonable cautioning of men will usually keep them from smoking where they will endanger the buildings and other property. Most men are disposed to be reasonable if approached tactfully.

Editor North Dakota Farmer:

I have a hog that was taken from a warm pen and left out of doors for two days. He is badly stiffened, and chilled especially so in the hind parts. Would castrating help or bleeding be good?

Please let me hear from you thru the columns of your paper, at your earliest convenience; and oblige.

Munich, N. D.

W. H. V.

Answered by Dr. Van Es

We do not believe that either castrating or bleeding would tend to improve the condition of this animal. In fact, we consider either operation more liable to do harm in a case of this kind.

What we would do, however, is to place the animal in a clean, warm and dry place and to feed him carefully on a rather laxative diet. For the rest we would let nature run its course.

#### RUSSIAN THISTLES ON FARM

A piece of ground was broke in summer of 1910, was thoroly disked and seeded to wheat in spring of 1911. Wheat grew very thick and heavy stand up to about July 1st when the extreme drought and heat nearly burned it; no crop except on low spots.

The field was then thickly covered by Russian thistles. What would be the best

crop to sow on this particular ground, and how should such land be worked for best results? It was not plowed last fall. The uncut wheat and thistles are holding considerable snow; ground is well soaked by the heavy rains in the fall.

Would flax likely do well on such land? Objection to flax is that it cannot keep

#### BANKSIAN PINE

This pine is most profitable for forest planting in the Dakotas, tho it is not generally known.

We have a few thousand plants which we would like to introduce along the N. P. and Soo lines. Write Ayers' Nursery, Aitkin, Minn.

## For Sale

### Fine Farm in the Best Watered Valley in Montana.

Forty acres under plow. A never-dry river runs across corner. County Road runs diagonally thru land. Irrigation ditch north of land, if you care to use it. Five miles to railroad. One of the finest apple orchards in world near mouth of valley. 400 acres plowed. Fine for grain, flax, etc. 225 acres grazing land. May divide if desirable.

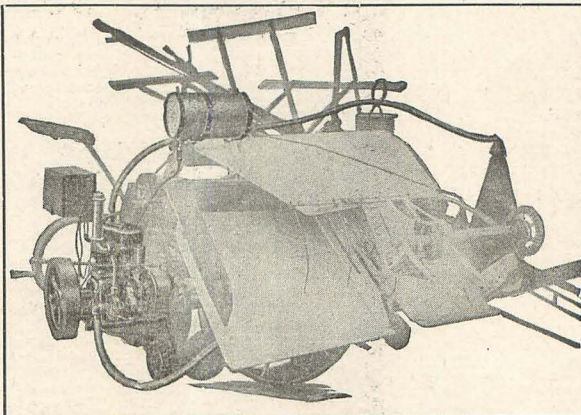
#### NO CROP FAILURES

Inquire of

R. M. SCHMERLER

17 South Sixth Street,

Mpls. Minn.



**Farm Cushman**  
4 H. P.—4 Cycle  
Four Successful  
seasons as the  
4 H. P. 167  
pounds weight

## Original Binder Engine

Directly attached by our complete brackets. The engine runs the machinery by direct chain drive and saves an extra team at harvest time. Hundreds of satisfied users in the Dakotas and Minnesota. Engine also used for any other farm power work from 1 to 5 H. P. Ask your dealer or write direct to factory for 36 page catalogue on this special engine built for the farmer.

## CUSHMAN MOTOR WORKS

2009 N. Street

Lincoln, Nebr.

# CO-OPERATIVE CREAMERIES

For Sixteen Years we have been organizing Creameries on a co-operative basis. Ask us for our Free Booklet on SUCCESSFUL CREAMERIES and HOW TO BUILD THEM

## CREAMERY PACKAGE MFG. CO.,

322 Third Street North,

MINNEAPOLIS, MINN.



ahead of weeds. Perhaps you can, or some of your readers could, advise how to handle this ground for flax: or would you recommend oats or some other crops.

Balfour, N. D. M. M.

#### Answered by Prof. Shepperd

Replying to M. M. I would say that flax is a poor weed-fighter and will not do well on land where weeds are as thick as described above.

Plow the ground rather shallow next spring—say four inches deep—and pack it with a harrow promptly after plowing, and seed it. Barley would be a good crop to keep ahead of your weeds, oats second and wheat third choice. These crops will not clean the land from weeds. A cultivated crop like corn or potatoes will do that.

#### SILO

How would it do to dig a hole in the ground and cement it up for a silo?

What would a silo hold, say ten by twenty feet, and how thick should the wall be?

Answer thru the North Dakota Farmer. Brazil, N. D. C. W. G.

#### Answered by Prof. Shepperd

In answer to C. W. G. I would say that a cistern style of silo will keep the ensilage as well as any other if the wall is tight.

Cistern silos are open to two objections. First, the silage is heavy to lift out of a hole in feeding it. Second, carbonic acid gas is very apt to form in a silo partially filled or being filled with ensilage and will suffocate any one going down into it.

With the above ground silo, having the doors left open, little danger is present as the doors or openings which occur at regular intervals up the building let the air circulate thru and keep the pit fit to live in. A lighted lantern let down will indicate, as in a well or cistern, whether it is safe for a man to go down into the pit. If the lantern goes out the air is bad, if it burns the air will support a man and it is safe to venture. If such a silo is built, however, some one is likely to go in without suspecting danger and suffocate. I, therefore, advise against risking a pit type of silo.

The North Dakota Farmer:

I would be very thankful to you for any information you think would be helpful in farming the following:

I am a new man in North Dakota and don't know whether my ideas are good or not.

Have 320 acres, of which one-half has been put to wheat for ten straight years. On that part, it doesn't pay to wheat it any more. Last year being a good year in this vicinity, it only made about eight bushels to the acre, being principally wild oats and pigeon grass. The land is thin, and I believe it has been wheated to death. Now I intend to sow barley to this 160 in the spring with a view in getting rid of the

wild oats, by sowing it early as possible. This ground was never plowed more than four inches deep till last fall when I went down six inches and turned up two inches of subsoil.

Would you advise sowing rye on this barley ground next fall if I wanted too, and would you disc it in with a disc drill, or plow under the green growth first, and then sow it?

Hope, N. D. Subscriber.

#### Reply by Prof. Shepperd

Replying to Subscriber, Hope, N. D., I wish to say that a better plan in my opinion would be to seed the land to timo-

thy and red clover this year with the barley crop and allow it to remain in hay or pasture for two years. If during that time it can be manured with stable manure so much the better. Little wild oat seed

## Why Rent a Farm

and be compelled to pay to your landlord most of your hard-earned profits! Own your own farm. Secure a Free Homestead in Manitoba, Saskatchewan or Alberta, or purchase land in one of these districts and bank a profit from \$10.00 to \$12.00 an acre every year.

Land purchased three years ago at \$10.00 an acre has recently changed hands at \$25.00 an acre. The crops grown on these lands warrant the advance. You can

**Become Rich** by cattle raising, dairying, mixed farming and grain growing in the Provinces of Manitoba, Saskatchewan and Alberta in Western Canada.

Free homestead and pre-emption areas, as well as land held by railway and land companies, will provide homes for millions.

Adaptable soil, healthful climate, splendid schools and churches and good railroads.

For settlers' rates, descriptive literature "Last Best West," how to reach the country and other particulars, write to Sup't of Immigration, Ottawa, Canada, or to the Canadian Gov't Agent.

**CHAS. PILLING**

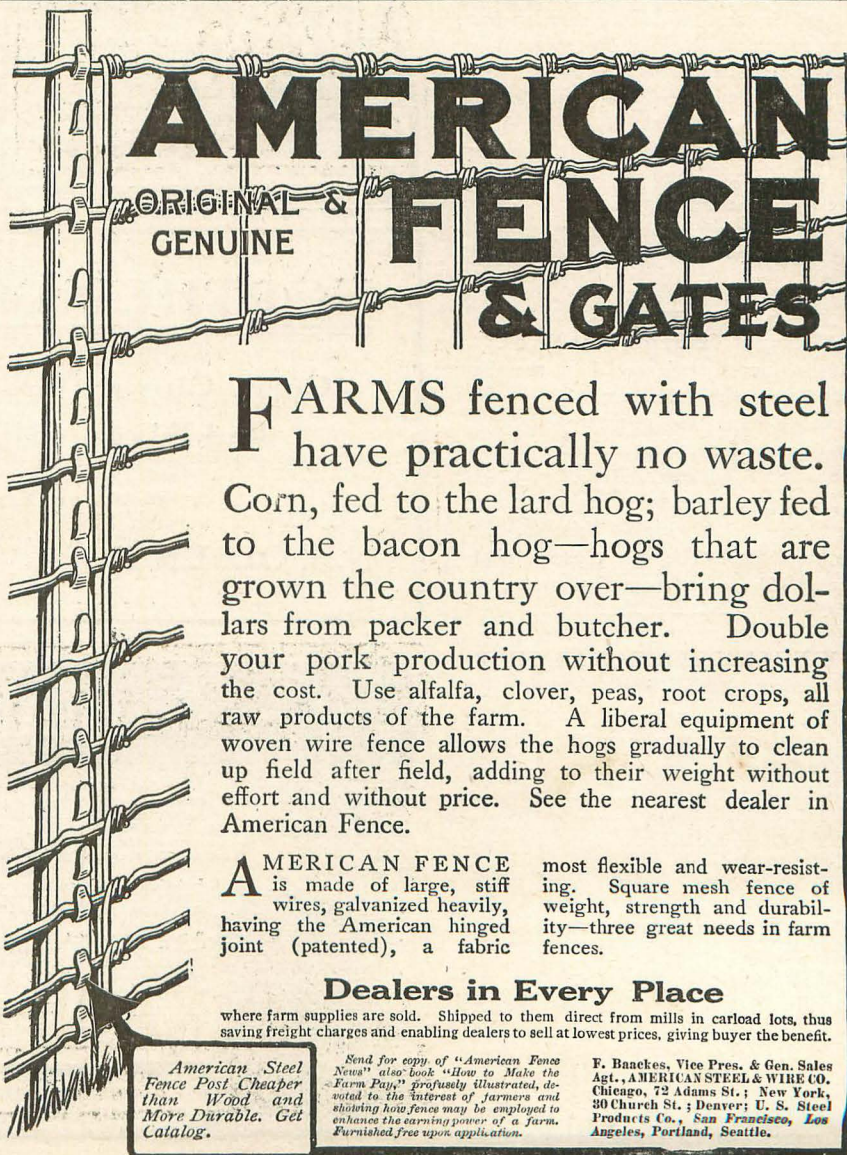
Clifford Block Grand Forks, N. D.

## MY FARM FOR SALE

In Benson County, North Dakota 320 acres. 280 acres in cultivation. Located 3 miles west of Leeds and 3 miles east of York. Good house and barn and good water.

Address H. N. MORKERT

Foley, Baldwin Co. Alabama



# AMERICAN FENCE & GATES

ORIGINAL & GENUINE

## FARMS fenced with steel have practically no waste.

Corn, fed to the lard hog; barley fed to the bacon hog—hogs that are grown the country over—bring dollars from packer and butcher. Double your pork production without increasing the cost. Use alfalfa, clover, peas, root crops, all raw products of the farm. A liberal equipment of woven wire fence allows the hogs gradually to clean up field after field, adding to their weight without effort and without price. See the nearest dealer in American Fence.

**A**merican Fence is made of large, stiff wires, galvanized heavily, having the American hinged joint (patented), a fabric most flexible and wear-resisting. Square mesh fence of weight, strength and durability—three great needs in farm fences.

### Dealers in Every Place

where farm supplies are sold. Shipped to them direct from mills in carload lots, thus saving freight charges and enabling dealers to sell at lowest prices, giving buyer the benefit.

Send for copy of "American Fence News" also book "How to Make the Farm Pay," profusely illustrated, devoted to the interest of farmers and showing how fences may be employed to enhance the earning power of a farm. Furnished free upon application.

**American Steel Fence Post Cheaper than Wood and More Durable. Get Catalog.**

F. Baackes, Vice Pres. & Gen. Sales Agt., AMERICAN STEEL & WIRE CO. Chicago, 72 Adams St.; New York, 30 Church St.; Denver, U. S. Steel Products Co.; San Francisco, Los Angeles, Portland, Seattle.



lives thru two average years in grass land as far east as Hope, N. D. If the seasons are particularly dry considerable wild oat seed will survive this treatment altho the total amount of it will be greatly reduced.

When broken up this land will be considerably enriched and improved. By introducing corn, potatoes or some other cultivated crop into this rotation so that its cropping system will run meadow, (manured) wheat or flax, corn, wheat and barley subscriber's land will improve in both fertility and freedom from weeds.

In using barley as a cleaning crop it is common to sow the barley rather late so that the warm weather will cause it to make a quick growth and thus get ahead and keep ahead of the wild oats. It will be necessary to give the land such cultivation at the time the barley is planted, as will kill out all of the wild oats that have started.

The plan which "subscriber" proposes, viz., that of putting in barley—which I would sow late instead of early—and of following it with winter rye will greatly reduce the wild oats but it will not enrich his soil. His deeper plowing is good altho he would have been a little safer to have taken two successive plowings to get down to his present depth.

I would plow the barley stubble land before sowing the rye. Rye will not require the stubble to protect it in winter and will on such land do much better to have a good seed bed.

The rye will ripen ahead of most of the wild oats and thus largely reduce that pest.

#### Cheapest To Plant Best Seeds.

It is our experience that the best seeds are the cheapest. Your best assurance that seeds are good is to buy of an old established house of good reputation. Northrup, King & Co., 709 Bridge Sq., Minneapolis, have sold Sterling Seeds for 28 years. Write for their free catalogue. They are represented by over 12,000 dealers in the Northwest.

#### BUYING SEEDS FROM MAIL ORDER HOUSES

A number of farmers and local dealers are buying seeds from seed houses outside the state of North Dakota. Some of these seedsmen are not as careful with regard to the seeds which they submit in this mail order business as they are of the seeds which are shipped direct to and kept in stock by dealers within the state, subject to inspection.

To illustrate this point I quote a portion of a letter lately received in this office.

Washburn, N. D., Feb. 13, 1912.

Dear Sir:

I am sending you a sample of alfalfa seed under another cover. I would like

very much to have you test this for me. I live in Montana, and intend seeding 30 acres myself. I expect to send for more seed from the same firm if it is good, for my neighbors. This test will do for all of us."

My answer was in part as follows:

"Dear Sir:

Referring to our Record N. 7016, your alfalfa, I am very sorry that you did not have this tested before you bought it. This sample is **illegal** for sale or distribution in the state of North Dakota. The foreign seed present is the small seeded alfalfa dodder. In one-sixth of an ounce there were 14 seeds of this dodder, so that on the average there would be over 75 seeds per ounce. This sample is also of rather low germination, giving only 64%, with 17% of actual dead seeds.

The Northwest Nursery Co. of Valley City has just issued a near, attractive, bargain catalog of prairie grown trees, fruits and shrubs. Any one interested can obtain one by dropping them a postal card.

ALFALFA  
LAND

**26,000 ACRES** of the finest Alfalfa Land on earth. Located in McHenry County, N. Dakota. Sub-irrigated. Pure water. Good railroads. Splendid markets. Any size tracts. Only \$25.00 an acre. Easy terms. **ALFALFA VALLEY LAND CO.,** 532 Pioneer Press Building, Saint Paul, Minnesota.

**STRAND'S HARDY NORTHERN**


GROWN TREES AND PLANTS.

They grow and please. Priced at ONE-HALF what agents ask. Send for a copy of our free catalogue today.

**STRAND'S NURSERY, Box 32**  
TAYLORS FALLS, MINN.

## Seed Oats

Hardy Canadian Grown



**A HANDSOME** white variety, early, rust resistant, strong, stiff straw, thin hull, heavy meat, soft nib, white berry. We offer hardy Canadian grown seed, weighing 44 lbs. to the measured bushel; very fine in appearance and of superb quality. No grower can afford to plant ordinary oats when seed of this quality may be obtained.

Bu. at \$2.35; 2 bu. at \$1.25; 10 bus. at \$1.20; F. O. B. Minneapolis.

**Sold by Over 12,000 Merchants**

For the convenience of planters we furnish dealers with our up-to-date seed cabinet containing a full assortment of **Sterling** vegetable and flower seeds. Most dealers also carry a stock of our heavier seeds in bulk, or will obtain them for you. If no dealer in your community sells our seeds or will not get them for you, order of us.

**Read About Oats in Our 1912 Catalogue**

This book contains 144 pages of valuable information for every planter of seeds. In it are listed hardy varieties of vegetable, flower, field and grass seeds, as well as shrubs, roots, plants, garden requisites, fertilizers, poultry supplies, etc. Write for it today. Free to every planter. **TRADE MARK**

**NORTHROP, KING & CO., Seedsmen**  
715 Bridge Square, Minneapolis, Minn.

## NORTHERN GROWN SEED


**Corn, Clover, Grass Seed, Seed Grain  
Red River Valley Seed Potatoes**

Write for Our 1912 Price List

**N. J. OLSEN CO.**

**MOORHEAD, MINN.**

## Oats, Alfalfa AND Potatoes



**SALZER'S REJUVENATED WHITE BONANZA OATS.**

Twenty acres of your land sown to this famous Oats should be good for 2000 bushels in 1912. These 2000 bushels for feeding purposes are worth to-day \$1000.00! Why not make this \$1000.00 for 1912? The White Bonanza Oats won, years ago, the Am. Agr. prize of \$500.00 in gold for the heaviest yielding Oats opened to the world, and in 1910 and 1911 the sworn-to yields range from 80 to 259 bushels per acre!

**SALZER'S HARDY ALFALFA.**

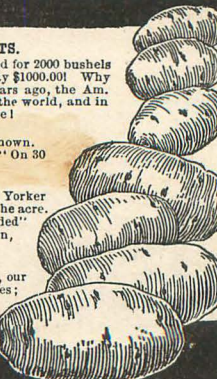
Is the biggest, quickest continuous money-maker for the farmer known. Ex-Gov. Hoard of Wisconsin says, regarding Salzer's Alfalfa: "On 30 acres I raised over \$2500.00 worth of Alfalfa hay."

**POTATOES.**

Potatoes are our great specialty. The Editor of the Rural New Yorker gives to "Salzer's Earliest" the astonishing yield of 464 bushels to the acre. Salzer's Catalog gives full description of heavy yielding "full blooded" pedigree stocks in Oats, Barley, Spring Wheat, Spring Rye, Corn, Clovers, Timothy, Potatoes, etc., etc.

**FOR 10c IN STAMPS WE WILL MAIL**

you a large package of Salzer's Famous White Bonanza Oats, our Hardy Alfalfa, together with many other rare Farm Seed samples; also big Farm Seed Catalog free for the asking.



**JOHN A. SALZER SEED CO.**  
215 S. 8th Street, La Crosse, Wis.



If farmers buy from seed houses outside of the state where we have no authority to inspect, they should take special care. However, if you will give me the names of such firms I think that I will be able to get them to do a better business in this state."

The lesson is obvious. If farmers contemplate buying seeds from order houses,

they should insist on having liberal samples submitted, and should either test them themselves or should submit them to the pure seed laboratory before they purchase and after they receive the supply as ordered

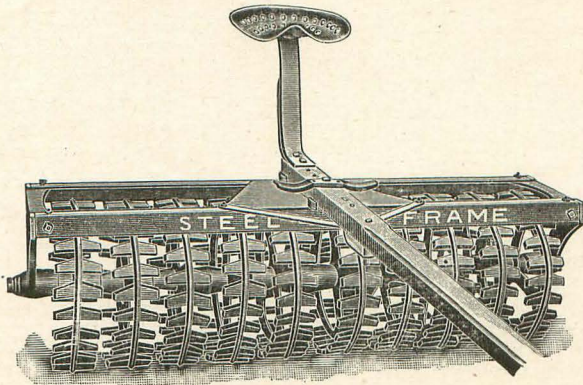
H. L. Bolley,

Botanist & State Seed Commissioner,  
Feb. 28, 1912. Agricultural Col. N. Dak.

### The Dunham Sub-Soil Packer.

The Sub-Surface Packer does not disturb the surface soil, but packs the lower surface of the furrow slice, pressing it into

Everybody has noticed at the end of the field, where the horses turn and pack the ground, the grain is much heavier than any other part of the field. **Positive proof**



good contact with the sub-soil, permitting the moisture to **pass up freely**.

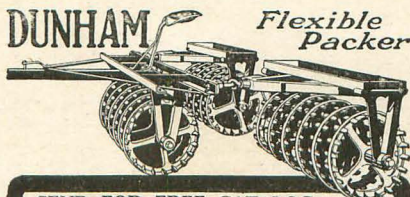
The moisture in the soil evaporates 18 per cent faster when the ground has not been packed.

### Specialists in Alfalfa.

We have known Northrup, & King Co., 709 Bridge Wq., Minneapolis, for a great many years and fields of alfalfa grown from their seed have produced immense yields. 12,000 dealers sell their Sterling Seed. For full information and prices write for their 28th Annual Catalogue. It is free.

### PREPARATION OF THE SEED BED FOR ALFALFA

When alfalfa is grown on corn or potato ground, the preparation of the seed bed is a comparatively simple affair. The land should be disked in the spring and worked with a peg-tooth harrow. After the disk-ing and harrowing the ground should be worked occasionally during the spring with



SEND FOR FREE CATALOG

This Dunham Three-Gang Flexible Packer adjusts itself to the inequalities of the field and packs the soil thoroughly, leaving no strips between the sections. Extra weight can easily be added in the angle-iron box frames. Dunham Packers, Pulverizers and Rollers are made for all soil conditions. Stock near you. Write us.

THE DUNHAM CO. 46-941 Ave., Berea, O

that grain is greatly aided by packing.

**Plow deep**, keep the surface loose, but the bottom of the furrow slice compact with the sub-soil.

disc and harrow in order to conserve the moisture and to kill the young germinating weeds.

Growing the alfalfa after a corn or potato crop is of added advantage in that the seed bed is firm below the top two or three inches. The small seed of the alfalfa and the delicate nature of the young plant demand a compact seed bed, in comparison to what is allowable for corn or even for wheat.

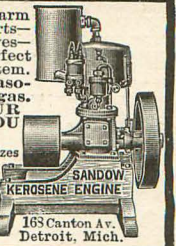
In an open, porous seed bed the soil is apt to dry out in the upper few inches, and if this occurs shortly after the germination of the alfalfa, the young seedlings are quite liable to die thru lack of moisture.

If alfalfa is to be grown after a crop of small grain the land should be fall-plowed. The fall plowing allows the seed bed to become more compact than spring plowing, and in addition aids in conserving moisture.

## Sandow \$37<sup>50</sup> 2½ H.P. Stationary Engine—Complete

Gives ample power for all farm uses. Only three moving parts—no cams, no gears, no valves—can't get out of order. Perfect governor—ideal cooling system. Uses kerosene (coal oil), gasoline, alcohol, distillate or gas. Sold on 15 days' trial. **YOUR MONEY BACK IF YOU ARE NOT SATISFIED.**

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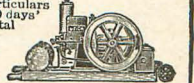


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Lafayette St.  
Utica, New York (10)



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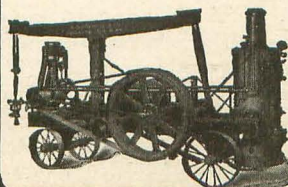
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R. R. HOWELL & CO., Minneapolis, Minn.



# North Dakota Farmer

Entered as second class matter in the postoffice at  
Lisbon, North Dakota.

**PUBLISHED EVERY MONTH**

**W. G. CROCKER, PUBLISHER.**

Lisbon, N. D.

**E. F. Ladd, Editor FARGO, N. D.**

**BUSINESS MANAGEMENT, LISBON, N. D.**

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PROF. C. B. WALDRON, Fruits, Forestry, and  
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Address all business correspondence to the  
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**Vol. 13 MARCH, 1912 No. 8**

Don't fail to test your seed corn.

Diversify.

Uninterrupted work during seeding and  
harvest will depend upon the attention  
you have given to repairing the machinery.

Rotate

You will rejoice that the crime of straw  
burning is on the decrease. There was a  
time when one might see at night a com-  
plete circle of burning straw stacks.

Test Seed.

We believe the house wife is just as  
much entitled to the latest home contriv-  
ances as the farmer is to the latest improve-  
ments in farm machinery.

Treat Seed.

Let us bear in mind that it is the profits  
that make farm life enjoyable and attrac-  
tive and that these profits are assured by  
intensive cultivation and rotation.

Diversify.

Recently a farmer purchased a quantity  
of seed corn and in the test, to his surprise,  
not one kernel germinated. This of  
course is an exception, but it ought to be a  
warning.

Rotate

Since it costs in the neighborhood of ten  
dollars to raise a brood sow to maturity, it  
behoves every stock raiser to give the  
brood sow and her offspring the very best  
attention.

Test Seed.

We speak from experience when we urge  
the purchasers of a gasoline or kerosene  
engine to first make sure of a solid founda-  
tion. It will certainly lengthen the life of  
the engine and increase its efficiency.

Consolidation goes on thruout the state  
regardless of the opposing patrons who  
will never be convinced of the advantages  
of consolidation unless they can be shown  
a dollar-and-cents value of improved fa-  
cilities.

Treat Seed

If you have never done so before, be-  
gin this spring to record all farm transac-  
tions, including a rotation plan for each  
year. Such a record would be a valuable  
asset should you ever wish to dispose of the  
farm.

Diversify.

The suggestion made by Pres. Worst re-  
garding the planting of trees by farmers  
east and west along the borders of their  
farms has created considerable interest.  
In the next issue Pres. Worst will explain  
more fully his plan.

Rotate.

Farmers, why not try this spring the  
split log drag on your own road? The  
time to begin is just after the spring rains.  
You can at least have a good road until it  
is completely destroyed by the road de-  
graders in the hands of novices.

Test Seed.

Have you noticed the new subscription  
price for two or more years? Why not  
remit \$1.50 for five years? The North  
Dakota Farmer is becoming more and  
more a necessity in the homes of the pro-  
gressive farmers of the state.

Treat Seed.

Last year there was so little moisture in  
the ground that excavating was possible  
thruout the winter, whereas during the  
past winter so deep is the frost that ex-  
cavation is carried on with the greatest of  
difficulty and frequently resort has been  
made to dynamite.

Diversify.

It is with deep regret that we learn of the  
resignation of Dr. Wiley, but we far more  
deplore the conditions which occasioned  
his resignation. Dr. Wiley has certainly  
fought for the interest of humanity and  
his name will be cherished long after the  
names of those who have opposed his  
laudable work have passed into oblivion.

Rotate.

A parcels post that provides for  
cheaper rates on the same rural route  
than between distant points, thus favoring  
the home merchant, ought to be satis-  
factory. This would enable him to com-  
pete favorably with the mail-order houses.  
We cannot see why every farmer in the  
state of North Dakota should not favor  
the measure.

Test Seed.

If the \$750,000 levied for road improve-  
ments in the state of North Dakota were

judiciously spent each year the state  
would be blessed with good roads and the  
farmer above all others would have oc-  
casion to rejoice. The time is not far dis-  
tant when the automobile owner on the  
farm will not be content with the shabby  
condition of the roads.

Treat Seed.

Since the founding of this paper all  
liquor, tobacco and patent medicine ad-  
vertisements have been rejected. Our  
policy has been to aid the farmers of  
North Dakota. We bitterly fought that  
fake medicine entitled "Liquizone." We  
find now in the place of Liquizone another  
medicine extensively advertised as hav-  
ing great health-giving qualities, when in  
fact it has little or no more nutritive value  
than so much flour. There are still many un-  
fortunates who continue to buy a kidney  
cure which has been found to contain  
exactly one hundred per cent sugar.

Diversify.

## PRACTICAL BOOK ON DRY FARM- ING

The latest book on Dry Farming is "Dry  
Land Agriculture" by Prof. Thomas Shaw.  
The book contains 460 pages and is well  
illustrated. The nineteen chapters dis-  
cuss every phase of the dry farming prob-  
lem. Its history, scope, domain, soils in  
dry land areas, plowing, cultivation,  
"Crops for Dryland Areas" takes up grains,  
grasses, legumes, cultivated crops, fruits,  
trees and vegetables, sowing, planting,  
pastures, rotation, stock, maintaining  
fertility and humus and water supply.  
Each one is taken up from the standpoint  
of how to do it, how to make use of it and  
the measure of success that can be ex-  
pected.

In relating the history of dry farming he  
brings out the fact that it is a practice that  
began before the Christian era. He  
brings this history up to the present day.

In speaking of the domain of dry farm-  
ing he states that "more than half of the  
tillable area of the world can be made pro-  
ductive only by resorting to dry farming  
methods of cultivation". The produc-  
tion on much of the land that is not  
strictly dry farming land can be much in-  
creased by putting into practice some of  
the dry farming methods.

Prof. Thomas Shaw is especially well  
qualified to write on this subject. His  
wide knowledge of agriculture, and the  
special study that he has made of farming  
in North Dakota and Montana thru ob-  
servation and his demonstration farms  
has given him an unusual fund of first  
hand information on the practical side of  
the work.

The book can be secured by sending two  
dollars to Prof. Thomas Shaw, at St. Paul,  
Minn.



## Pure Food Advertisers

The products advertised below are in compliance with the pure food law of North Dakota and of the highest grade.  
ASK YOUR GROCER FOR THEM.

“BUY”

“EAT”

### HOME BRAND

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“ECONOMY” “SATISFACTION”

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MANUFACTURING  
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CORNER THIRD AND BROADWAY



One package, 10 cents, makes one pint of wholesome Fruit Jelly. All flavors from true fruits.

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PURE FOODS

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PURE FOODS

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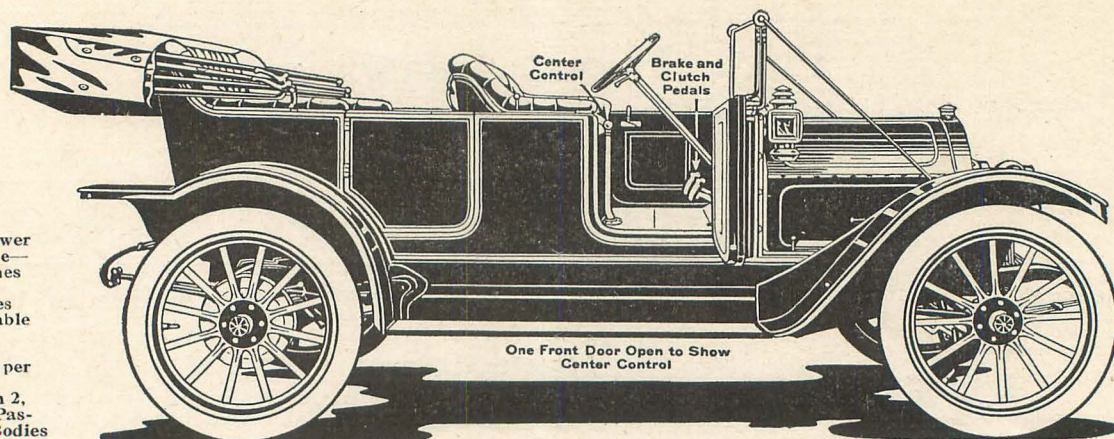
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Lisbon,

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Horsepower  
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4 and 5 Pas-  
senger Bodies



Top and windshield not included in price. We equip this car with mohair top, side curtains and slip-cover, windshield, gas tank and speedometer—all for \$100 extra. Self-Starter, if wanted \$20 extra

## Reo the Fifth—\$1,055

# The Car That Marks My Limit

*By R. E. Olds, Designer*

I have no quarrel with men who ask more for their cars—none with men who ask less. I have only to say that, after 25 years—after creating 24 models and building tens of thousands of cars—*here's the best I know.* I call it My Farewell Car.

I don't wish to surround this new car of mine with any intangible glamour.

Glamour is always expensive.

I am simply a shop man, engineer and designer. In my earliest memories I was putting around my father's engine works.

On leaving school I began engine building. And the Olds Gas Engines—famous half the world over—gained their place by actual merit.

For 25 years I have built automobiles. I began with single-cylinder, six-horse-power machines. And I've run the whole gamut to six-cylinder sixties.

Tens of thousands of men, in those 25 years, have used cars of my designing. Just because they relied on me, year after year, to build the best of the current cars.

I recite this to show that I am essentially practical. I shall never attempt to create any illusions. So what I say here about Reo the Fifth will be simple, plain, everyday fact.

### No Sensations

Reo the Fifth is no great innovation. The time has gone by for that.

Thousands of good men, for two

decades, have worked at perfecting cars. Together they have brought the modern automobile pretty close to perfection.

I believe that this new car embodies the best that all these men have accomplished: I searched the whole world for ideas for it.

It represents, in addition, the best I have learned thru 25 years of continuous striving. So it comes, I believe, pretty close to finality.

The worth of a car, in these days, depends on no exclusive devices. It depends on facilities, on experience, on honesty of purpose, on the genius for taking pains.

Here I offer you all those—each in the extreme. And no motor car maker, whatever his price, knows how to offer more.

### The Lessons Taught by Tests

My chief advantage lies here:

I was among the first to start learning the needs of automobiles. And I learned faster than others, because I had more cars out.

Experience is our greatest teacher. The inexperienced designer, however well-meaning, is bound to make countless mistakes. One learns only through errors the need for infinite pains.

One cannot anticipate every possible weakness. He must watch how cars, under some conditions, fall down. Then make the fault forever impossible.

In this way we learn to multiply margins of safety. We learn the need for exactness, for careful inspection, for laboratory tests. What once seemed sufficient becomes recklessness later.

Thus I have been learning for 25 years, through the myriads of cars I have built. And the flawless construction of this Reo the Fifth is due to that boundless experience.

### Common Weaknesses

I might mention a thousand points which have thus been perfected, but I'll deal with the leading essentials.

The main source of weakness in motor cars is steel. It is due to ignorance, to carelessness or skimping.

By countless tests I have learned the best alloy for each purpose. And, to be sure that I get it, I analyze each lot of steel.



For the axles and drive shaft I use Nickel Steel. I use Vanadium Steel for connections. For the gears I use the most perfect alloy ever worked out for this purpose.

To test these gears, which others test with a hammer, I have built a crushing machine of 50 tons' capacity. There I submit the gears to a crushing test, to measure exactly what each gear will stand.

The Nickel Steel axles are much larger than necessary. Every year I have built them stronger. Now my margin of safety in this vital part is considered extreme by most makers.

For the bearings on axles and on the transmission I use Timken Roller and Hyatt High Duty. Lesser bearings have led to trouble.

I have found that magnetos differ immensely. So I devised a test where, for ten hours a day, the magneto must act under tremendous compression. I have found only two makes which stand it.

Half the troubles with cars are due to a carburetor incapable of dealing with low-grade gasoline. So I adapted a carburetor to the commonest grades. And I doubly heat it—with hot air and hot water—to facilitate evaporation.

I add about one-fifth to the power of

my engine by putting intake valves on top.

The long-stroke motor, the cylinders in pairs, the dust-proof transmission, the system of oiling, all simply accord with the best modern practice.

I carry inspection to the farthest extremes. Every part is inspected—every vital part tested. That is essential. Without it, flaws will creep in which only use can discover.

### Good Measure

Another thing I have learned is that buyers enjoy good measure.

My wheel base is long, my wheels extra large, my tonneau is roomy. The car is over-tired. The springs are much stronger than necessary.

The design of the car, as each can see for himself, has the last touch of up-to-dateness.

The upholstery is deep, the filling is hair, the covering is genuine leather. I avoid all the petty economies.

The body finish consists of 17 coats. The lamps are enameled, as per the latest vogue. Even the engine is nickel trimmed.

The most perfect car will fail to

satisfy buyers unless its appearance is perfect.

### Exclusive Features

In addition to all this, Reo the Fifth has two or three features found in no other car.

One is the center cane-handle control. See the picture. All the gear shifting is done by moving this handle not more than three inches. It moves in four directions—for low speed, intermediate, high speed and reverse.

Another unique feature is the absence of brake levers. Both of the brakes operate by foot pedals. One of the pedals operates the clutch and the service brake as well.

So the front of the car is clear. The driver dismounts on either side as easily as you dismount from the tonneau.

This arrangement permits of the left side drive. The driver sits, as he should sit, close to the cars which he passes. He sits where he can look back in making a turn. He is on the up side of the road. This has only been possible heretofore in electrics.

These are features to which other cars must come. But you find them today only in Reo the Fifth.

# Price—the Only Sensation

## Fixed Month by Month

The only sensation in this Reo the Fifth is the price at which we shall sell it.

All the rest results from an earnest desire, in this my final achievement, to give the best that a car can give.

If I have done that—and I believe that I have—the price of \$1,055 is both unique and sensational.

Most other features are found in some other cars. But no price like this—nor any price near it—can be found elsewhere in any car of this class.

Now I wish to explain the reason.

### Paring Down Cost

For the past several years, my chief effort has been to cut down the cost of my cars.

I have felt that my place in the future depended as much on paring of cost as on skill in designing.

I have been helped in this by an enormous demand for my cars. Our multiplied output has cut overhead cost.

I have also been helped by the goodwill these cars created. Each has helped to sell others. So selling cost is a fraction of what it was.

I have helped myself by inventing special machinery. The parts are now made by automatic machines, invented and built in our shops. Labor cost, on some parts, has been divided by fifty. And we get the utter exactness which hand work never gave.

We now make in this whole shop only

one style of chassis. That saves in itself nearly \$200 per car.

We have standardized the car, so that changes aren't necessary. Our tools and machinery last until we wear them out.

The whole car is now built in this one model factory, so we pay no profits to parts makers.

This year, in addition, we have cut a big slice from our profits. This new car, we figure, will more than double our output. And our profit hereafter will be a trifle per car.

### Price Not Fixed

We have also adopted a changeable price. The price of today is based on today's price for materials—the lowest they have been in years. But our contracts with dealers provide for instant advance.

The price of \$1,055 is the minimum. It can certainly never go lower. But, if cost advances, the price must be advanced. Price cannot be fixed for six months in advance without leaving big margin, and we haven't done that.

This initial price is the minimum. It is the lowest price, in my estimation, which an equal car ever will cost. But that is today's price only. I very much doubt if Reo the Fifth can long be sold that low.

### My Supreme Effort

A hundred makers will argue that their higher-priced cars offer more than does Reo the Fifth.

I don't wish to dispute them. Judge that for yourself. It isn't hard to make actual comparisons.

Whatever the verdict, I can only say that this car marks my limit. I would not know where to add a single iota if paid a doubled price.

Better materials I know are impossible. Better workmanship is out of the question. Better features and devices, if they exist, are still unknown to me.

More power is possible, but not economical. More size, room and weight can be had, of course, if one thinks them worth the price. But more of care or skill or quality is totally out of the question.

This Farewell Car is my finest creation. If others do better, they are better men than I.

### Ask for Catalog

This car with roadster body sells for \$1,000. With close-coupled body or touring car body the price now is \$1,055. Our catalog shows the various body designs.

It also gives complete specifications. It enables comparisons, part by part, with any other car.

The book is ready for mailing. Ask for it now, as this car at least is worth investigation. When we send the book we'll tell you where to see the car.

Address

**R. M. Owen & Co.,**

General Sales  
Agents for  
Canadian Factory, St. Catharines, Ontario

**Reo Motor Car Co., Lansing, Mich.**



# Livestock Department

## FARM AND STOCK NOTES

N. J. Shepherd

There is no profit in weeds.

Grain raising robs the soil; animal husbandry restores it.

It takes three-fourths of what a cow is able to consume for maintainance.

Any unusual excitement at milking will often cause the cow to withhold her milk.

Continuous grain growing wears out the soil faster than most other lines of farming.

Rotation of crops has proved an excellent means of sustaining yields of grain and conserving soil fertility.

One advantage in dairying is that it takes less fertility from the soil than other branches of farming.

digestive powers it is very poor economy to keep the hog on short rations.

Plants will starve in any soil, however fertile, unless water is present to dissolve the food elements and prepare them for the plant's use.

That a good horse may result, the colt should not only be given a good start in life, but should be kept in healthful and thrifty condition thruout the growing stage.

A profitable cow for the farm is one that can produce in a year, or still better a series of years a good maximum yield of butter at a cost that will yield a profit to her owner and also produce a strong, healthy calf each year.

Rest and fat are the greatest enemies of the horse. The horse is the creature of motion and in its feeding and management



### Three Essentials in a Happy, Prosperous Farm.

Testing affords the dairyman an opportunity to eliminate the poor cows and to select the calves from the best.

Subsoiling and deep plowing mean deep storage of the rainfall and less risk of waste by surface evaporation.

No animals enrich the fields in which they graze to so great an extent or so completely give back to them all they take, as sheep.

*Neglected or half starved colts* mean mature horses which do not pay for their raising, let alone returning a profit.

With his wonderful appetite and strong

this should be remembered, as soon as hard labor ceases, or constant and vigorous exercise is over it will be necessary to reduce the allowance of food.

To succeed in any vocation in life there must be work to do all the time and a man must be willing to do it.

When trees or small fruit plants are to be set out in the spring, care should be taken to do the work as early as the condition of the soil will admit. The decided advantage in this is that when set early they will become settled in place and secure a good start to grow before dry weather sets in.

## STATE DAIRYMAN'S ASSOCIATION

W. C. Palmer

The North Dakota State Dairymen's Association was held at Mandan Feb. 15th and 16th. This was the 18th annual meeting. One hundred and eight years ago Lewis and Clark wintered here on their way to the Pacific. The changes wrought are well brought out in J. W. Foley's poem "Sunset on the Prairie." A few lines follow,

They have tamed it with their harrows,  
they have broken with their plows;  
Where the bison used to range it some  
one has built himself a house;  
They have stuck it full of fence posts,  
they have girdled it with wire,  
They have shamed it and profaned it  
with an automobile tire

They have made themselves a pasture  
where the timid deer would browse,  
Where the antelope were feeding they  
have dotted o'er with cows;  
There's a yokels tuneless whistling  
down the bisons winding trail,  
Where the redman's arrow fluttered  
there's a woman with a pail  
Driving up the cows for milking; they  
have cut its wild extent  
Into forty acre patches till its glory all  
is spent.

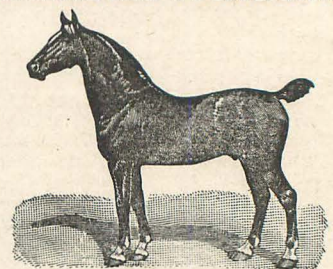
After the preliminaries of an address of welcome by Mayor Packard and the

## VETERINARY COURSE AT HOME.

\$1200 year and upwards can be made taking our Veterinary Course at home during spare time; taught in simplest English; Diploma granted positions obtained for successful students; cost within reach of all; satisfaction guaranteed; particulars free. **Ontario Veterinary Correspondence School, London, Can.**

Warranted to Give Satisfaction.

## Gombault's Caustic Balsam



### Has Imitators But No Competitors.

A Safe, Speedy and Positive Cure for Curb, Splint, Sweeny, Capped Hock, Strained Tendons, Founder, Wind Puffs, and all lameness from Spavin, Ringbone and other bony tumors. Cures all skin diseases or Parasites, Thrush, Diphtheria. Removes all Bunches from Horses or Cattle.

As a Human Remedy for Rheumatism, Sprains, Sore Throat, etc., it is invaluable. Every bottle of Caustic Balsam sold is Warranted to give satisfaction. Price \$1.50 per bottle. Sold by druggists, or sent by express, charges paid, with full directions for its use. Send for descriptive circulars, testimonials, etc. Address

The Lawrence-Williams Co., Cleveland, O.



address of welcome by Prof. G. L. Martin the addresses followed. Fred L. Merrill gave a stereopticon lecture on how to select the dairy cow, showing the type and emphasizing the points that indicate dairy qualities. Prof. Thomas Shaw then brought out the points in the breeding of the dairy cow. His arguments pointed to the need of breeding in one line, common cows could be made the foundation stock, and bred up by the use of a pure bred sire but always select the sire from the same breed.

Several of the addresses were on food for the dairy cow. Prof. J. H. Shepperd gave a striking talk on corn grinding, showing by a series of charts the importance of allowing the corn to get nearly ripe as at that time it contains the most and the best food value. In fact from the time the corn tassels out till it is ripe the dry matter increases five fold. Mr. A. J. Grover gave an interesting talk on silage. He emphasized the need of letting the corn get nearly ripe before it is put into the silo. It makes the best ensilage at that time and it will also have the most feeding value. He compared ensilage to pasture in the good effects that it has on the dairy cow. Mr. A. K. Risser discussed silo construction. He brought out the fact that the cement silo can be built quite cheaply, the cost of a 125-ton silo running from \$250 to \$350. If the sand and gravel are to be had on the farm and the labor is not counted then the cost of the cement reinforcement becomes a small item. He also said that the kind of material had practically no effect on the freezing of the silage. Even the hollow tile is no better in this respect than the solid construction of reinforced concrete. Alfalfa came in for a discussion by Supt. L. R. Waldron. He called attention to its high feeding value, as well as its drought resisting qualities. He stated that it is important that the plants be given plenty of room in order to be drought resistant. Five pounds is enough to sow per acre. Pastures was the subject of an address by Prof. Thomas Shaw. He called attention to the value of rye for a spring pasture. He regarded brome grass as the best pasture plant of any single plant. He advocated a mixture of 3 pounds bromus, 3 pounds slender wheat grass and 3 pounds of alfalfa.

The handling of the dairy product came in for a number of discussions as follows:

A. E. Greenwood advocated grading the cream and paying according to grade. He found that he could pay three cents more per pound for the first grade cream than for second grade. A lively discussion followed this address. O. A. Storvick discussed Up-to-Date Butter Making Methods. He described the methods of receiving cream, of sampling, and economies that could be observed in running the creamery. F. D. Currier claimed that the success depends on the local co-operative creamery, and that much of its success depended on the people working together

and that the same man be manager and secretary.

Governor J. Burke addressed the meeting. He urged making the farm pay. He claimed that this would help keep the boys and girls on the farm. He extolled the habits of industry that come with dairying.

"Bart" of the Minneapolis Journal gave a very interesting chalk talk. Agriculture, politics and fashions received the most attention. Music and readings were furnished by local talent of high merit.

The silver pitchers put up by the N. P. Railroad for the best creamery and dairy butter were awarded by D. E. Willard as follows. For best creamery butter to J. M. Hein of New Salem with a score of

93. For best dairy butter to Mrs. L. L. Hagland of Medina.

The following officers were elected: Pres., Wm. F. Stege, Medina; V. Pres., U. J. Downey, New Salem. Sec., Robert F. Flint, Bismarck; Treas., Prof. G. L. Martin, Agricultural College.

The attendance was much greater than at any previous meeting and the enthusiasm was at a high pitch. The banner that served as a badge of membership had this quotation on it. "We have one thing that has never disappointed us, that is a herd of pure-bred dairy cattle."

**Are you boosting the North Dakota Farmer? One year, 50 cents; three years, \$1.00.**

#### ST. PAUL UNION STOCKYARDS CO. REPORT FOR FEBRUARY, 1912

##### Comparison of the Origin and Disposition of Livestock

Origin of Livestock Received						
States	Cattle	Calves	Hogs	Sheep	Horses	Total Cars
Minnesota.....	13300	5548	75295	11477	71	1568
Wisconsin.....	1150	479	7217	833	1	157
Iowa.....	185	77	1335	70	212	39
Far South.....					301	16
So. Dakota.....	813	91	3912	478	110	89
No. Dakota.....	1972	186	3956	2484	30	149
Montana.....	826	2		12625		96
Far West.....					25	1
Manitoba & N. W. T.....						
Far East.....						
Returned.....	365	2				9
Total.....	18611	6385	91715	27967	750	2124
Disposition of Livestock						
So. St. Paul P'k'rs..	8486	4854	68352	13240		
City; State Butch..	690	321	3644	448		61
Outside Packers....	42		19491	736		170
Minnesota.....	1767	410		217	316	81
Wisconsin.....	441			105	123	22
Iowa.....	1615	70	119			49
Nebraska.....	510					13
Kansas & Missouri..	673					19
So. Dakota.....	417	1				10
No. Dakota.....	175				58	8
Montana & West....	459	56			18	17
Far South.....	194				25	6
Manitoba & N. W. T.	1			345	85	
Mich. & E. Can....						
Chicago.....	1210	8	140	17902		139
Ills (ex Chicago)...	1133	12		133		39
Eastern Points.....	30				86	5
Returned.....	356	2				9
Total.....	9713	880	23394	19886	711	657

## SEED CORN

Our stock was gathered early, is kiln dried and has been thoroughly selected, graded and tested.  
Heavy demand—limited supply, so order early if you want GENUINE NORTH DAKOTA SEED CORN,

## Alfalfa, Clover, Timothy

Don't delay renewing your pastures this year with our seeds which are unexcelled in purity, vitality or productiveness. Our 1912 Catalog is free—send for one.

**FARGO SEED HOUSE**

Fargo,

North Dakota



## SPECIAL DAIRY TRAINS IN IOWA

During the winters of 1910 and 1911 the Iowa State Dairy Association operated special dairy trains over the Chicago Burlington & Quincy, the Chicago Great Western and the Chicago Milwaukee & St. Paul Railways in Iowa. These trains made over 400 stops where lectures and cow demonstrations were delivered to over 100,000 people that were interested in dairying.

The results of these trains have manifested themselves favorably in many ways. Farmers have become interested in better dairying. They have substituted good cows for poor ones; placed at the head of their herds good, pure-bred dairy bulls; erected silos; raised clover and alfalfa where less productive and less valuable timothy hay formerly grew, and, in fact, have demonstrated in many ways that the results of the dairy trains were especially valuable directly to the farmers, and therefore indirectly to the towns which they visited.

Due to this success other roads have become interested in the opportunity of gaining such results and now the Iowa State Dairy Association has been called upon to run similar trains on several roads this winter. Arrangements have been made with the Chicago Rock Island and the Illinois Central to cover all of their lines in Iowa with fully equipped special dairy trains during the months of February and March.

The trains will consist of an engine, baggage car, two passenger coaches, diner and sleeper. The lecture coaches will be manned with some of the best speakers on dairy subjects in the United States. The lectures delivered will be practical and helpful in every way. Such subjects as "Silos and Silage," "Breeding, Feeding and Management of Dairy Cows," as well as "The Importance of Testing Individuals" will be treated.

To further assist in making the lectures clear, the coaches will be equipped with miniature silos, testing apparatus, etc. The baggage car will be equipped as a modern dairy barn with patent stalls and stanchions. It will carry some of the most improved specimens of dairy animals which will be used at each station to demonstrate the essential characteristics of the profitable dairy type.

Further information will be given as soon as definite arrangements for the schedules have been completed. As these two railroads operate thru the dairy districts of Iowa very successful meetings should be held at every town.

### Immense Yield of Seed Oats.

Hardy Canadian grown oats famous for immense yields can be obtained from Northrup, King & Co., 709 Bridge Sq., Minneapolis, or from any of their

twelve thousand dealers. Prices are very reasonable and none of our readers should plant ordinary oats when such good seeds is obtainable.

## THE BUSINESS OF DAIRYING

"In much of the West cattle raising for beef has long been the principal business," says Secretary Wilson, "but dairying is comparatively new. There is an extensive market, however, for dairy products; and especially in the newly settled regions it is found that the dairy industry fills such a place in agricultural economy that its development is urgently needed.

"In addition, a special enterprise has been undertaken with creamery patrons in Iowa, the object being to determine whether it will pay creameries to carry on the same sort of work among their own farmer patrons for the sake of getting a better quality of cream as material for making butter. Here also record keeping has been introduced, along with other improved methods, and the effort is made to discover the leaks that reduce profits.

"In the older states of the North, where dairying is already an established and highly developed industry, the work of the Department outside of advice to individuals upon request, consists chiefly in the propagation of cow-testing associations

and the improvement of city milk supplies. Cow-testing associations are societies for cooperating in the keeping of herd records by engaging a man who goes from farm to farm periodically, makes observations, and keeps records for the herds of all the members of the association. By this means records are secured without the trouble or expense involved

## A PRETTY CATALOG

A pretty catalog has just been issued at Valley City by the Northwest Nursery Co. It shows many photos of their fields of young trees, fruits and shrubs. It is a great surprise to learn what they have accomplished on the prairies at Valley City, with hardy varieties.

It also gives their best bargains for this spring's planting.

Those interested should ask for one before they are gone. Drop a postal to

**The Northwest Nursery Co.**  
Valley City, - - - N. D.

## Farmers--Silo Your Fodder

The untold advantages of the silo and the possibilities of its development and use, are becoming known to increasing thousands each year.

**Now is the Time to Start. Get Started Right and RIGHT NOW**

FIRST—Get a Good Silo, and Get It Early.

SECOND—Erect and Fill It.

THIRD—Wonder How You Ever Got Along without It.

## The Weyerhaeuser Silo

Is made on the Pacific Coast, the home of fir lumber

**Strong Permanent Swinging Door, Steel Hoops and Anchors  
COMPLETE WITH ROOF IN ONE SHIPMENT**

CALL ON YOUR LOCAL  
LUMBER DEALER. HE IS  
OUR AGENT

HE WILL GIVE YOU  
ILLUSTRATED BOOK AND  
PRICES

OUR SILO IS PROTECTED  
BY PATENT. NONE GENU-  
INE without LICENSE TAG

Manufactured Only By

**WEYERHAUSER LUMBER CO.**  
**EVERETT, WASHINGTON**



when each man keeps them for himself; and in various other ways the cooperation of the farmers is productive of profit. The primary objects are to detect and weed out inferior individual cows, and by the use of purebred bulls to perpetuate and intensify the valuable characteristics of the cows that are found to be good ones—thus raising the average quality of the individual cow and the total productiveness of the herd. There are 85 cow-testing associations now in 20 states, comprising 45,000 cows.

"The records of one of these associations show that the profit was doubled after four years' work. For instance, a man with eight cows found, the first month of keeping records, that he was losing five and one-half cents per cow, or 44 cents on his herd for that month. After three

months' testing he was making a profit of \$32 a month on the herd, and at the end of the year his profit has increased to \$50 a month. This notable increase was due largely to the sale of five of his poorest cows, and the purchase of as many well-producing ones to take their places. In addition there were changes made in the method of feeding, which conduced to the result."

## W. F. JACOBS

**Pedigreed Livestock  
Farm Sales and  
Real Estate Auctioneer**

Write for Dates. Terms Reasonable

**LISBON, - N. DAK.**

### ST. PAUL UNION STOCKYARDS CO. REPORT FOR FEBRUARY, 1912 Comparison of Receipts and Shipments of Livestock

Receipts						
Railroads	Cattle	Calves	Hogs	Sheep	Horses	Total Cars
C. R. & P.....	520	95	2591	8	34	59
C. G. W. ....	917	264	6072	382	1	122
C. M. & St. P. ....	3007	762	14818	2129	90	334
M. & St. L. ....	2014	719	13750	1056	.....	270
C., St. P., M. & O..	2426	599	25542	2097	519	463
C. B. & Q.....	227	154	2279	289	.....	43
M. St. P. & S. S. M..	2363	1126	6030	986	1	191
Gt. Nor.....	4030	2152	16555	12171	77	459
Nor. Pac.....	2345	429	3442	7701	26	183
St. P. B. & T. ....	.....	.....	.....	.....	.....	.....
Driven in.....	762	85	636	1148	2	.....
Total.....	18611	6385	91715	27967	750	2124
Increase.....	.....	.....	22698	7900	503	216
Decrease.....	4322	1836	.....	.....	.....	.....
Jan. 1 to date.....	38941	12982	236661	64728	1176	4995
Increase.....	.....	.....	63999	22964	730	767
Decrease.....	5564	2000	.....	.....	.....	.....
Average Wts.....	866	177	207	92	.....	.....
Shipments						
C. R. I. & P.....	535	.....	.....	.....	.....	18
C. G. W. ....	1558	170	170	4466	9	70
C. M. & St. P. ....	1468	147	12606	6872	89	203
M. & St. L. ....	303	5	.....	69	.....	11
C., St. P., M. & O..	2184	74	9996	968	91	170
C. B. & Q.....	1657	3	.....	5574	68	94
M. St. P. P. & S. S. M.	342	10	161	1789	87	31
Gt. Nor.....	444	38	134	.....	171	26
Nor. Pac.....	794	68	.....	100	64	34
St. P. B. & T. ....	.....	.....	.....	.....	.....	.....
St. P. B. & T. ....	.....	.....	.....	.....	.....	.....
Driven Out.....	428	365	327	48	132	.....
Total.....	9713	880	23394	19886	711	657
Increase.....	.....	.....	3554	8516	523	.....
Decrease.....	5526	996	.....	.....	.....	44
Jan. 1 to date.....	17937	2123	59984	40520	1145	1361
Increase.....	.....	.....	10234	16324	771	.....
Decrease.....	9040	1219	.....	.....	.....	51

## CLASSIFIED ADS.

### One Cent a Word

Small advertisements will be classified under appropriate headings at the low price of one cent a word for each insertion. Cash must accompany all orders. Each initial or number must count as one word. TRY IT HERE.

### LIVE STOCK

#### HORSES

##### FOR SALE

Percheron, Belgian and Shire horses  
J. W. & F. T. PETERSON, Litchfield, Minn.

MEADOW LAWN FARM. has for sale prize-winning Young Percheron Stallions, and Shorthorn Bulls bred hornless.

Our large herd contains many of the finest individuals from the east. Prices right with terms to suit purchaser.

Our motto: The best is none too good.

A. H. WHITE, Kramer, N. D.

#### CATTLE

North Branch Stock Farm. High class Shorthorns. Herd, bull, Supreme Judge 177722—pure Scotch, John Donnelly, Grafton, N. D.

##### FOR SALE

#### GALLOWAY CATTLE

J. W. & F. T. PETERSON, Litchfield, Minn.

#### SWINE

POLAND CHINA PIGS. also Shropshire sheep. Seed grain. GEO. N. SMITH, Amentia, N. D.

### EGGS AND POULTRY

EGGS FOR HATCHING. White Plymouth Rocks (Fishels Strain) \$5 per 15. I have the Best in the Northwest. No exceptions. Indian Runner Ducks from Choice High Bred Stock, \$2.50 per 11. Canadian Wild Geese, \$1 per egg.

C. H. McGEHE

Oriska, N. Dak.

### MISCELLANEOUS

Envilla Stock Farm, Cogswell N. D. will quote you special prices on Angus Cattle, Shetland Ponies, Duroc Jersey Hogs, Wolfand Fox Hounds, Pure Bred Poultry, Pet Stock. Write them.

#### THE MOUSE RIVER LAND AND LOAN COMPANY AND THE MOHALL STATE BANK

At Mohall, Renville County, North Dakota, have a large list of farm lands for sale, and terms and prices are better than in any other part of North Dakota. They would be glad to have you write them for prices and terms. Our slogan is, "Own your own home in the Mouse River Loop."

FOR SALE: Registered Jerseys. Bull calves and one mature Bull at reasonable prices. W. G. Weeks, Backoo, N. Dak.

#### RED-POLLED AND GALLOWAYS

##### Shropshire Bucks

J. S. BIXBY, - - LISBON, N. D.

WANTED—Young Men to take the Railway Mail Clerk examination called for the Dakotas; salary \$900, work half time, common school education required. Passing means appointment. American Institute, Dept.—68-Dayton, Ohio.

FOR SALE. Creamery in first class condition at a bargain at Crystal, N. D. For further information write to J. S. GESTSON, Sec. CRYSTAL, N. D.

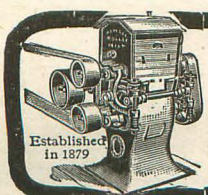
#### FARMS WANTED

TO FARM OWNERS: Our plan puts you into communication with buyers at low cost; write for particulars.

Co-operative Advertising Company  
Fergus Falls, Minn.

FOR SALE AT A BARGAIN. As I am hard up, must sell my 1/4 section of Kidder Co. land, worth \$3,000. \$2,000 will buy it before March 15, 1912. One-half cash, balance to suit you. Owner, Lock Box 2, - Pettibone, N. D.

A BARGAIN FARM. 200 acres, 9 miles from Eldon Miller Co., Mo., a Division point in Rock Island, R. R. 125 acres in cultivation; 100 in bottom, no buildings; good orchard, fine water, well fenced; 30 acres meadow. \$20 per acre. Other good farms for sale. Goodrich Realty Co., Eldon, Mo.



## ROLLER FEED MILLS

The only scientific and up-to-date method of grinding feed. Burr and stone mills have had their day. At present cost of land and labor you can't afford to feed whole grain—one-half of it properly ground by our roller process has equal value. Our mills have great capacity—require little power—last a life-time. Built in 13 sizes to suit any power. Write for catalog D 6

R. R. HOWELL & CO., Minneapolis, Minn.



## WHERE THE DAIRY INTERESTS STAND ON OLEOMARGARINE LEGISLATION

George M. Whitaker, Sec. National Dairy Union

The existing oleomargarine law was framed with a desire to promote commercial honesty and to protect both consumer and producer.

The food value of oleomargarine does not depend on its color, while the dishonest sales of the article are possible solely on its color being such as to counterfeit butter; the fallacy of the claim that oleomargarine is colored to make it more palatable is shown by the fact that different colors are natural to different products, that no color is—in and of itself—more palatable than another—the color desired for oleomargarine is the color of butter.

The commissioner of internal revenue asserts now that this law has been to an extent a disappointment for three reasons (1) Adverse decisions of some courts as regards certain administrative features; (2) Adverse decisions of the courts thru

the presence of the word "artificial" before the word coloration; (3) the great disparity—40 to 1—in the tax on colored and uncolored oleomargarine. The first objection has been removed by a recent decision of the supreme court. The Dairy Union directors after a full consideration of existing conditions and taking counsel of those representing the National Grange, the Farmers' National Congress and other organizations has decided to meet the other objections to the law, and also to show that the dairymen do not want "to tax the poor man's butter" or "add to the cost of living" by favoring a reduction of all taxes to a nominal figure. But the Dairy interests will insist that no oleomargarine shall be manufactured or sold in imitation or semblance of butter of any shade of yellow.

The Dairy Union believes that the line between genuine and dishonest oleomargarine is based on color, and that some form of color regulation is necessary to maintain that line. A bill has been drafted expressing the ideas of the Union, and members of Congress should be promptly informed by letter and telegram of the wishes of the dairymen. Lose no time.

## WINNERS OF BUTTER CONTEST

Mrs. John Britt, jr., was successful in winning the high score in the butter contest at the North Dakota Corn and Clover convention at Grand Forks, the results of the scoring being announced by R. F. Flint, state dairy commissioner, who was in charge of the department.

There were thirty-three entries of dairy butter, much of which showed wintry conditions and flavors.

Thirteen were successful in securing a score of over ninety, being as follows:

Mrs. John Britt, Grand Forks....	93
Miss Gertrude Hoglo, East Grand Forks.....	92
Miss Clara Dubuque, Grand Forks..	92
Walhalla Roller Mills, Walhalla....	91
Mrs. Alex Coulter, Mallory.....	91
Mrs. O. Danielson, East Grand Forks	91
Mrs. David Chisholm, Grand Forks	91
Mrs. K. O. Hofto, Thompson.....	90
James Barrett, Arvilla.....	90
Effie Ferguson, Mallory.....	90
Mrs. Henry Root, Grand Forks....	90
Mrs. Dan Supernant, East Grand Forks.....	90
Mrs. Ole T. Sollom, Reynolds.....	90

**FLAX**—I have 200 bushels Choice Flax for sale; raised on sod and re-cleaned. \$2.50 per bu. Sacks extra. D. W. Swanson, New Rockford, N. D.



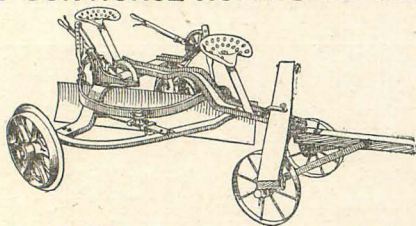
Purebred Registered  
**HOLSTEIN CATTLE**  
The Greatest Dairy Breed  
Send for FREE Illustrated Book  
Holstein-Friesian Assn., Box 135 Brattleboro, Vt

### A RARE CHANCE

I have a house at Ellendale, N. D. which I wish to sell or trade for land. It is within two blocks of the Normal-Industrial School; six rooms; two stories; two bed-rooms upstairs; large living and dining room; fireplace in dining room; good large basement; wired for electric light; heated by hot water with a steel boiler of the locomotive type; bath room and plumbing all complete; practically new; and beyond doubt the best location in the town. Southeast corner front; cement sidewalks on either side; lot 125 ft. front; buckthorn hedge; garden; driveway with trees; young fruit, etc. An ideal location for a man who wants to educate his children. Under ordinary conditions I would not want to take much less than \$5000 for it, but I will sell it now at a bargain or trade it for a first-class quarter of land. Only A1 land considered.

Address **FIRST NATIONAL BANK Ellendale**

## FOUR HORSE ROAD GRADERS



**Rural Road Grader and Irrigation Ditcher  
and Edwards New Reversible Road Grader**  
Besides Graders I manufacture the best

**STEEL ROAD DRAGS**

Don't buy GRADERS or DRAGS before you get my Prices and Descriptive Catalog.



Clearing land with one of my Stump Pullers. Catalog will come for the asking.

C. D. EDWARDS, ALBERT LEA, MINN.

## Poultry Department

Geo. Hausmann, Hillsboro, N. D.

### TO THE AMATEUR STARTING TO RAISE POULTRY

C. C. Dibley, Wolverton, Minn.

Go slow is my advise, procure a trio or pen from a reliable breeder and buy as good as you can possibly afford.

Better spend a few dollars for your foundation flock than lose a good many dollars at the end. I am not going to say which breed is the best; start with the kind that appeals to you. See that the male bird is a good strong and active fellow and chuck full of fight. Use hens or a good reliable incubator for hatching the eggs. My advise is, don't buy a cheap incubator, for most of them will hatch eggs, but if you want to raise good strong chicks that will mature good strong birds, buy an incubator that will do the trick. Nearly all of our show birds are hatched with incubators.

See that your birds are absolutely free from lice, for if they are infected with lice, the fertility will be somewhat impaired, dust occasionally with insect powder, and disinfect once or twice a week; see that your coops are clean and kept clean.

For feed we use one part cracked corn, two parts wheat, four parts of good heavy oats, and add a little buckwheat and millet seed, scattered morning and evening in

deep litter. Keep dry mash in hoppers before them at all times, composed as follows: two hundred pounds of bran, fifty pounds of cornmeal, one hundred and fifty pounds of wheat midlings, fifty pounds of alfalfa meal, ten pounds granulated charcoal, thirty pounds meat meal, one and one-half pounds of some good poultry tonic. Once or twice a week a wet mash as follows: two parts bran, one part corn meal, one part scalded alfalfa, a little meat meal, and charcoal.

We are frequently asked how much we feed. On the average a small handful will be about right twice a day. You can tell by actions of your fowls about how much they require when you enter the coops. Be sure that your fowls have plenty of fresh water at all times. Scald your drinking fountains once or twice a week. We also keep grit, oyster shell, and charcoal before them at all times in hoppers.

This may seem like lots of work but if you don't want to look after the small details you had better not venture into the poultry business. On the other hand if you take care of them right you will find it a pleasure, as well as profitable.

### EGGS FOR HATCHING

Fresh layed eggs from Pure Bred White Plymouth Rocks of the big utility kind, \$1.50 for 15. \$8.00 per 100. Pearl Guineas, \$2.00 for 15. L. G. Gemmil, Edinburg, N. D.



Mrs. W. B. Wilcoxon, Hillsdale, Wyo.

Pure air must be supplied at all times if the fowls are to do their best. Pure, fresh air is a tonic, an invigorator, and will do more toward keeping the fowls healthy than all nostrums ever invented. Even if the poultry house is properly ventilated, it should be thrown wide open for a while each day, if only for five or ten minutes on the coldest days. This daily airing will do much toward keeping the interior of the house from becoming damp and filthy and will help to keep the fowls in perfect health. Another plan for supplying fresh air is to open the window and have a muslin-covered frame to fit into the space. Fresh air will go thru the muslin, and at the same time there will be no direct draft. Whatever plan is used pure fresh air must be supplied. It is a necessity, just as essential to health as food and water.

The feeding of the flock during the winter months is altogether a different proposition from feeding in the summer when the fowls have free range and can pick up a great variety of food. During the winter months, especially in parts of the country wherever the ground is covered with snow a greater portion of the winter months from November to March, every ounce of food that the fowls get must be supplied by the owner. When on the range in the summer time they pick up a great portion of their food. So during the winter months we must supply the equivalent. It is necessary that the fowls have some form of animal food, feed about an ounce a day to each bird.

People who have had the experience know it to be a positive fact that frosting the toes, combs or wattles of a hen will put a stop to egg production. The old hen man will tell you that a hen will not lay again until spring if her toes once get frost-bitten, and if the weather nips her comb. She is so fastidious that she will not visit the nest again until her head piece has resumed its normal condition. This may be simply obstinacy and perverseness on the part of the old hen, but we must take her as she is and not as we

would like to have her. It is useless to criticize her, nonsense to blame her, and the height of folly to abuse her.

Keeping poultry for the production of eggs, to realize a profit and make a success requires some experience, more, in fact, than most people imagine. Do not get the idea that all there is to it is getting some incubators and filling them with eggs and hatching them out in the spring, and by fall have laying hens; and that, when eggs are high, you will be taking in some of the high prices that are quoted in the papers. That theory looks nice when you are not in the business. But try it and see what your experience will be. You may be surprised. It will not be much trouble to find a good second-hand outfit nearby fitted up with the latest, improved ideas for the raising of poultry, abandoned simply because the owner did not have any experience in the business and made a failure of it.

Some people seem to think that the poultry business can be overdone, but there has never been any indication that it can be, and there is every indication that the demand is greater every year. It is said that New York City consumes 4,000,000 eggs daily. How busy the hens must be kept to supply the demand. Many eggs are shipped in from foreign countries into the city. I find that even city people will have hens who have only a very small lot, in small cities hens are very numerous. In Denver I have seen many poultry plants located in the perfectly kept grounds around a city home.

**FOR SALE.** Silver Laced Wyandotte Cockerels, \$1 apiece.  
Charles F. Mayo Tower City, N. D.

## A Fine Bunch of White Holland Turkeys

—at the—

**Willobank Farm**  
Eastgate Bros. Larimore, N. D.

1900	<b>C. C. DIBLEY &amp; SON</b>	1912
<b>BREED THE BEST</b>		
Barred Plymouth Rocks	Light Brahmas	Single Comb Rhode Islands Red
White Plymouth Rocks	Buff Wyandottes	Columbian Wyandottes
Look up our winning in Poultry Herald, February and March numbers.		
<b>Stock and Eggs for Sale</b>		
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Box 30, Mankato, Minn.



The coops are neat and attractive painted the color of the residence. Everything is kept scrupulously clean and the profits derived from such plants are greater than are sometimes secured from farms covering a large area. You may be surprised when I tell you that most of the fancy poultry is reared in cities. I have seen many cities that looked like an island entirely surrounded by chicken yards.

Last year the poultry industry in America approached almost a billion dollars. Now adays the man or woman who raises and markets poultry and eggs is envied. The business is profitable, the possibilities grow greater right along. The number of farmers and farmers' wives and daughters who have taken up seriously modern poultry raising as a profitable adjunct to modern farming is growing enormously. It is said that it requires about five hens to each person to supply each with enough eggs to use. There is no danger along the line of over production when it takes over 45,000,000 eggs every day in the United States to supply the home market. What a cackling there would be if all the hens could all be congregated on one place. It is said that the cackling of geese saved Rome, and if meat prices still continue to go up, the cackling of the hen will at least help save the United States. Many farmers are awakening to this fact and are today building better poultry houses. Every avenue of commercial endeavor is strewn with wrecks, so it is in the poultry business. Learn to work and to wait. It is not by persistent work alone that we may hope to secure the maximum of result. We must work with system and with judgment, otherwise no matter how hard we work, we will not accomplish what it merits.

It is a hard, climb to the top of the hill of success in any calling, and unless your plan of work is well thought out there will be many disappointments and discouragements. If you start out in a hit or miss way you will generally miss. Know what you are going to do before starting out. Give your poultry operations careful thought, then with your plans well laid follow persistently to a finish and your prospects will be bright.

Somebody is going to get into trouble shipping rotten eggs. The Government is after every man who ships rotten eggs. The States, thru their Food Departments, are after the men who ship rotten eggs. The consuming public is becoming thoroly disgusted and are complaining against the handling of rotten eggs, eggs which are unfit for use, which have been kept for weeks and months. Such eggs are being handled by the dealer and are brought in by the farmer. The farmer is not so much to blame as some of the dealers, who accept them and also who keep them on hand for months before shipping them.

Eggs should be gathered every day from the nest and each week taken to the market; otherwise, many of the eggs will be unfit for use. They will sooner or later be condemned by the officials who have to look after these matters, and you may be

finned in the Courts for selling such as articles of food.

Fresh eggs may be preserved for a considerable length of time when properly kept in cold storage; or, for home use, eggs may be put up in water-glass, but such eggs should not be sold as fresh eggs.

## Elementary Agriculture

McNeal, C. James

### The Babcock Milk Test McNeal C. James

A great deal of work has been done along the line of investigation of dairy cows during the last few years. It has been found that there is a great difference in the ability of different cows to produce milk and butterfat. For example, in one of our best agricultural states, it has been proven, by a long series of investigations, that two-thirds of all the cows of the state (1,000,000 in all) are kept at a loss by their owners. The other third are paying for their own board, keeping many of their worthless sisters and making a fairly good profit for their owners.

The only way to tell what a cow is doing is to weigh the milk from each cow and make a test for butterfat often enough to find the average test.

Some dairymen and farmers think this too much bother. One of these fellows kept 40 cows and sold \$1,800 dollars worth of milk from them in one year. His near neighbor milked 20 cows and sold \$2,000 worth of milk. The first barely made expenses, while the latter realized a profit of a thousand dollars.

The butterfat test is made with the Babcock tester. While this is an operation requiring very careful work, it is not a difficult one. The apparatus consists of a tester, milk bottles, a pipette, an acid measure, and about a pint of commercial sulfuric acid. The testing is done somewhat as follows:

#### Sampling of Milk

The cow is milked dry; the milk is then poured from one pail to another for several times in order to thoroly mix the milk. Then take a few ounces from the center of the pail. The pipette is then placed in the milk and nearly filled with it by causing a suction on the larger end, when the index finger is quickly put over the larger end. The milk should then be allowed to drop from the lower end until it stands even with the mark on the pipette.

The small end of the pipette is then placed in the neck of the milk bottle and somewhat at right angles to it. The milk is then allowed to run down the side of the bottle. Care must be taken that not a drop of milk is lost in this operation or the result will not be accurate. Two bottles should be filled in this way from the same milk, so one will be a check upon the other.

#### Using the Acid

The acid is measured by pouring out

17.5 cc. of it in the glass measure. It is then poured down the side of the neck of the bottle. When half of the acid is poured in the bottle, the bottle should then be giving a circular motion in order to mix the acid and milk. The rest of the acid is to be put into the bottle then and the same circular motion given to the bottle. When the acid is poured into the milk it causes a good bit of heat, hence the bottle should always be held by the neck to avoid being burnt.

Sulfuric acid is very strong and will burn the skin, clothing, or any thing it touches; for this reason one must be very careful in handling it. If any should be spilled on the skin or clothing, water should be applied as soon as possible. If a considerable amount is used the acid will not do much harm. It is also poisonous, hence should be kept away from children.

#### Whirling the Milk

After the bottles have been filled as directed, they should be placed in the tester, always putting them on opposite sides to balance the tester. The milk should be at about the temperature it was at time of milking to get best results. The machine is then rotated at proper speed for five minutes, care being taken not to start or stop the machine too quickly. After being whirled for five minutes, the bottles are then filled with hot water to the neck, when they are whirled for two minutes. Water is again added until the top of the fat column is near the top of the marks upon the neck of the bottle. After the machine has again been whirled for a minute the fat column is ready to read.

#### Reading the Fat Column

Keep the bottles warm. Hold the bottle up so the top of the fat column is even with the eye. Read the graduation at the extreme top and bottom of the column. The long marks upon the neck of the bottle stand for the percent of the contents, while the short lines stand for tenths of a per cent. Subtract the lower reading from the upper. The difference is the per cent of butterfat.

If the fat column is clouded with white specks the acid is too weak. If it has black specks in it the acid is too strong.

A Babcock tester can be purchased from the Creamery Package Co., Minneapolis, or from the Central Scientific Co., Chicago. The complete outfit costs about \$5.00 minus the 30% discount to schools.



## Home Department

### THE FARM HOME MANAGEMENT Miss Ilena Bailey, University of Missouri, Columbia, Missouri, in Dry Farming

A wise man has said: "As your women are, so will the nation be. No nation can rise above the level of its women. The country woman has her part, an important part, to play in the nation's development."

In no other occupation is the wife her husband's business partner so much as on the farm. Until recently she has usually been a silent partner, but now both are coming to realize that the silent partner needs to get in touch with the outside world as much as the active partner. While he informs himself on the best methods of dry-farming, she must learn how to improve conditions in the home and to establish higher ideals in her community, and together they will manage the farm better than ever before.

In my town several years ago, there was a smallpox scare and many of the children were vaccinated. A neighbor boy of four came to play with his friend who had the mumps. I met him at the door and explained that he would get the mumps if he came in. He put his right hand upon his left arm and in a surprised voice said,—"I—I've been waxinated."

Sometimes in solving the problems of rural life, like this boy, we think one preventive, or cure, is all we need to apply. The problems are complex. Some of us are working for better schools, some for better churches, others for better social and political activities, good roads, larger financial returns, and better homes. It is only by working together, the scientist and practical farmer, that we can solve the problems of rural life. Profitable farming leads the way to the solution of many of the other problems, but will not solve them unaided.

#### Unit is the Individual

Farm home management aims to help farm women by meeting their problems on their own ground. It aims to put into practice on Missouri farms those principles of home economic and agriculture which have been tested out by scientific experiment. The basis of our work is the individual: our motto, "Do." From the individual we make county and state organizations, instead of forming the state organization first with the expectation that local organizations will follow,

which in some instances they have not done. Farm home management was begun September 1, 1911, at the university of Missouri, in cooperation with the department of farm management, which has been doing much for Missouri farmers since its establishment a little more than one year ago.

A woman asks us to assist her to make her home better. I arrange to visit the farm and go over the house, the yard, poultry house, garden and orchard with her—if she is the manager of either of the latter—and many a farmer's wife is, on the average Missouri farm.

We talk over the possible improvements that can be made with the amount of money that she can spare for this purpose. We look into the future and decide on either of the end we hope to reach, then work toward that as fast as finances will permit.

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### Changes Planned to Save Steps

On one farm, which I visited not long ago, the house had been built only a few years previously to meet the needs of a family of eight. It was thought at that time to be as nearly ideal as finances would permit. Fortunately, the upstairs had not been finished, so this gave us a chance to make some changes without much difficulty. The house was so built that in each of the five bedrooms it was possible to put in another window, so that cross ventilation and more light could be secured and the rooms made much pleasanter. Closets for each bed-room were arranged for, also a bath-room. By moving the kitchen sink, all plumbing could be easily made into one system.

The kitchen was very dark because of a very dark green paint upon the walls. Changing this to a white with a stencil border in light blue will make a great difference in the amount of light in the room. Then the dining-room joined the kitchen at one corner, while just in front of the kitchen was a bedroom. The closet and bed-room are to be made into a dining-room and the former dining-room will become a sitting-room. This will save many steps in placing and removing dishes and food from the dining table. Convenient cupboards can easily be built in the kitchen.

By cutting an outside door into the reception room of the house and building a small porch over it, the entrance can easily be changed to the side nearest to the drive instead of on the opposite side where it is at present. With these changes, one farmer's wife will be saved unnecessary steps now taken and a little time will be found for much needed rest. The poultry house, garden and orchard on this farm are in good condition, so our advice will be directed toward getting larger returns from poultry and more variety in the vegetable garden.

Sometimes, the house is a log one, with sunken floors and leaky roof, which must be made comfortable for the winter; sometimes it is too small and must have an addition. Again, the ceilings and floors will need raising and the upstairs rooms need more windows.

### Water Supply and Drainage

A good supply of pure water is another thing that I try to get on each farm that I visit, also good drainage for the waste water, which is so often thrown between the well and the kitchen door. The purchase of conveniences, household furniture, wall paper, and floor coverings are other problems which I try to meet. Color combinations and good line enter into house furnishings and the lay-out of the yard. This is an opportunity for the farmer's wife to increase some of her love for the beautiful.

Food for the farmer's table is an-

other problem I try to meet. In some food remains on the table from one meal to another, except such as is served hot, until it is eaten up. There are often several kinds of jellies or preserves and canned fruit on the table at one meal. If hot food is left over, it will be served in the same form at the next meal. The baby with two teeth will be fed on meat and then the mother wonders why the baby cries, or is sick. These farm women have been so busy with the details of washing, ironing, sweeping and cooking, that they have fallen into the habit of cooking the same food in the same way and do not think of the many possibilities of change.

The keeping of farm accounts has shown several farmers where they have made poor investments. We expect the accounts of poultry, the home dairy, the garden, the orchard, and the household expenses to show how the farm home can be better managed to get more for the time and money expended. In some homes a needless amount of time is spent in the kitchen; in others not enough. With the same expenditure of time and energy the few pounds of surplus butter over that used by the family will often bring 10 or 15 cents more a pound if the milk and cream are better cared for and the product put up in brick molds. By care in gathering eggs and in selecting poultry larger returns will be received.

The women on demonstration farms are an example to their neighbors who inquire how certain results are obtained. All the farmers' wives in the neighborhood are helped by having

an example of good home management before them year after year. They see and believe and try the same things in their own homes. The plan is to have only one demonstration farm in a county and to hold a public meeting on this farm once a year to show what results have been obtained, in the house and in the field.

The farmer who receives the assistance of the department of farm management pays nothing for the service, neither does the department pay the farmer or loan him money. Those who become members of the farm management association may become co-operators. From the co-operators, one demonstrator for a county is chosen. His farm is called a demonstration farm. There is a long waiting list of names of those who want us to visit their farms. Several farmers with whom the department is now working were planning to move to town because farming would not pay. After a year's trial they were convinced that a well managed farm would pay and more are now glad to stay on the farm.

Thru farm home management we believe farm life can be partly relieved of its drudgery, that the silent partner will advise remaining on the farm, and that both the farmer and his wife can later be interested in the improvement of the rural schools and churches.

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## UNCLE SAM'S WORK FOR THE AMERICAN HOUSEWIFE

No branch of the general government comes so near to the life of the people as the U. S. Department of Agriculture, which deals with the cotton and other fibers of which our clothes are made, the flocks and herds we raise, the crops we produce, the food we eat, and the timber of which our houses are built.

The closeness of the relation between the Department and the people is in great measure due to the fact that the use which is made of agricultural products receives as much attention as their production, and the great bulk of these products are used in the home. Commenting on this phase of the Department's work Secretary Wilson said today: "Commercial industries were long ago studied by scientific methods since it was found that gaining knowledge by experience was much more costly than gaining it by systematic study. It is only lately that we have come to realize that it is equally profitable to study the housekeeper's problems. Fifty years ago few such questions had been taken to the laboratory and few schools gave instruction in such subjects. Today very many men and women of scientific training have taken the home problem to the laboratory and are finding ways of helping the housekeeper to solve her problems satisfactorily. More than one hundred agricultural and other colleges in the United States now offer courses in home economics, as this general subject of the study of home problems is called, and cooking or some other branch of the subject is taught in hundreds of high schools in the United States. The Department of Agriculture has studied many questions which relate to the use of agricultural products on the farm and in the home, but perhaps none of them has a closer relation to the household than the nutrition investigations of the Office of Experiment Stations, which have to do with the use of agricultural products as human foods, and whose object is to help the housewife in her efforts to provide good living at reasonable cost, without undue labor."

The results of the work have been summarized in Farmers' Bulletins, twenty-four in number, on a great variety of topics, such as the food value of milk, sugar, bread, meats, fruits, and vegetables; methods of preparing food for the table, and the care of food in the home. The first edition of Farmers' Bulletins on food topics, as is the case with all Farmers' Bulletins, is relatively small and reprints are issued only as they are needed to meet the popular demand. That the information presented has been appreciated is shown by the fact that a total of 9,968,000 copies have been required up to date to meet the demand, or one bulletin to every ten persons of the ninety odd millions making up the population of the United

States. In the case of every one of these bulletins over 100,000 copies have been needed to meet the request for them, and in the majority of cases three or four times this number, the demand, apparently, having a direct relation to the subject-matter, the bulletins dealing with the commonest food materials being the most popular. Thus, over 700,000 copies have been published of the bulletins on bread making. Of Farmers' Bulletin 128, "Eggs and Their Uses as Food," 555,000 copies have been distributed, and of Farmers' Bulletin 121, "Beans, Peas and Other Legumes as Food," 420,000 copies. The publications which deal with the preparation of food have been particularly sought after, 762,000 copies having been issued of Farmers' Bulletin 203, "Canned Fruit, Preserves, and Jellies—Household Methods of Preparation," and 740,000 copies of Farmers' Bulletin 256, "Preparation of Vegetables for the Table." The bulletin which heads the list in the demands which have been made for it is Farmers' Bulletin 391, "Economical Use of Meat in the Home," which discusses the preparation of this staple food material with reference to economy as well as palatability. In the two years since this bulletin was published eighteen regular editions, aggregating 1,420,000 copies have been issued by the Department of Agriculture, and, in addition, a special reprint of 500,000 copies ordered by Congress, making a total of 1,920,000 copies. In so far as its resources permit, the Department of Agriculture sends Farmers' Bulletins to all citizens of the United States who request them, but the most wide-reaching distribution is that made by Members of Congress. As a whole, the Farmers' Bulletins, which reach every State and county, and almost every village and farm, have had a wonderful influence on farming, as shown by improved methods of cultivation, better crops, and better utilization of the crops after they are grown.

The figures quoted with respect to nutrition problems show clearly that the housewife appreciates the Farmers' Bulletins, which deal with her problems, as fully as does the farmer those which pertain to his work. The widespread distribution of information pertaining to home problems means a relative increase in the available food supply since it makes possible a better and more economical use of available resources and shows how unnecessary waste and loss may be avoided.

The Department of Agriculture not only helps to make two blades of grass grow where one grew before but also helps the housekeeper in her efforts to make one dollar do the work of two in providing for the family table to meet the daily requirements for food, the tastes of the family, and the family income.

North Dakota Farmer: Fifty Cents a year; 1 yrs., \$1.00. Agents wanted.

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profession—all these things have been the subject of repeated comment. Now we learn that the manufacturers of the "ethical proprietaries" have taken a leaf out of the "patent medicine" men's notebook; they, too, have organized within the last few days and have formed the National Association of Manufacturers of Medicinal Preparations. Most of the large manufacturing pharmaceutical houses have joined it. This organization, like its "patent-medicine" prototype, has apparently been created with but one object in view, to make money, honestly if possible, but to make money. This, at least, we gather from the very full report, given in the "Oil, Paint and Drug Reporter," a conservative and reliable publication, of the meeting at which organization was accomplished. The representatives of various pharmaceutical houses met in New York and were in session two days. In these days the association went on record as opposing the modification of the Food and Drugs Act, recommended in President Taft's special message, which would "prevent 'cancer cure' fakers and others in similarly disreputable businesses from publishing lies on the labels of their nostrums. In other words, the members of the National Association of Manufacturers of Medicinal Preparations seem to believe that a person should be allowed to make all the false statements he pleases, providing he confines his lying to therapeutic effects. The association also opposes the Richardson bill, which is one of the bills before Congress drawn for the purpose of strengthening the Food and Drugs Act. It further went on record as opposing the Mann bill, which would regulate the transportation of habit-forming drugs. The association registered a strong protest against Senate Bill 4727, which would require the weight or measure of all drugs sold in package form to be plainly printed on the label. Finally, the association admitted that it was organized for the purpose of opposing the campaign against ready-made mixtures. In fact, taking it all in all, it is difficult to see, says "The Journal of the American Medical Association," that the ethical stand of this organization of manufacturers of "ethical proprietaries" is in any degree higher than the stand taken by the manufacturers of "patent medicines."

#### THE USE OF PAINT ON THE FARM (Concluded)

By Percy W. Walker, Bureau of Chemistry, Washington, D. C.

#### Estimated Cost of White Paints

A vehicle for outside paint of the best quality will generally consist of from 90 to 95 per cent of linseed oil and from 10 to 5 per cent of japan drier. A good japan drier has about the same specific gravity as linseed oil, and each may be

considered to weigh about seven and three-quarters pounds to the gallon. Of course, the prices of all paint materials vary, but at the present time linseed oil sells for approximately 90 cents a gallon, and a good grade of japan can be brought for \$1.60. In making up paints, the drier should be mixed with the larger portion of the oil before adding the pigment. Using the prices and weights just given for linseed oil and japan drier, the liquid portion of a paint will cost about 95 cents a gallon, or twelve and one quarter cents a pound. White lead, both dry and in the form of paste, costs approximately 7 cents a pound, zinc white approximately 8 cents a pound, and the other white pigments which cover well will not differ very much from these two in price. A gallon of white lead paint will weigh from 21 to 22 pounds. Fourteen pounds of dry white lead and seven and one quarter pounds of vehicle will make a gallon of paint and at the prices quoted the cost would be about \$1.87; 15 pounds of paste lead and six and one quarter pounds of vehicle will make a gallon of paint, costing \$1.82; nine and one quarter pounds of white zinc and five and three quarters pounds of the paint vehicle will make a gallon, of zinc white paint costing about \$1.46.

Of course, these prices are based on an assumed cost for the ingredients, and to make an exact estimate it would be necessary to know the exact prices of the different materials entering into the paint. Many painters insist that a paint composed entirely of white lead, linseed oil, and drier is the best. Others contend that a mixture of white lead and zinc white is the best, and still others say that a

mixture of these pigments with the cheaper white pigments which have slight covering power makes a better paint than the expensive pigments alone. It is probably true that a mixture of lead and zinc is superior to either pigment by itself, and also that the addition of a small amount of so-called inert pigments (silica, whiting, barytes, china-clay, etc.) has no injurious effect on the paint and may even be beneficial. The addition of a large amount, however, of such pigments will give a paint deficient in covering power, and the addition should have the effect of cheapening the product. There is no reason why any mixed paint should cost per gallon more than a paint made entirely of white lead, oil, and the necessary drier. By ascertaining the market price of white lead and linseed oil the buyer should be able to calculate the maximum price for a mixed paint.

Two samples of ready-mixed white paints which were bought at the same time, at practically the same price, will give an illustration of the difference in price of such materials. No. 3361, a white paint, weighed 12.4 pounds to the gallon. The total paint consisted of 63 per cent pigment and 37 per cent vehicle. The pigment contained 30 per cent zinc lead, 13 per cent white lead, 7 per cent whiting, and 50 per cent barium sulphate. Assuming the value of the zinc lead to be the same as that of the white lead, 43 per



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cent of the pigment was worth 7 cents a pound, and assuming the value of the whiting and barium sulphate to be 1 cent a pound, 57 per cent of the pigment was worth 1 cent a pound. The average price per pound of the pigment would, therefore, be 3.58 cents. A gallon of the paint weighs 12.4 pounds, of which 63 per cent, or 7.812 pounds, is pigment; this, at 3.58 cents a pound, would cost 28 cents. Thirty-seven per cent of vehicle in the gallon of paint will weigh 4.588 pounds. In this paint it consisted of linseed oil and a cheap drier costing about 11 cents a pound, or 50 cents for the vehicle. The total cost of the materials in the paint, then, would be 78 cents per gallon.

Another paint, No. 3864, weighed 14.8 pounds per gallon and consisted of 58 per cent of pigment and 42 per cent of vehicle. The pigment was 55 per cent white lead and 45 per cent zinc white. If the price of these two pigments was 8 and 7 cents, respectively, the average price of the pigment in this paint would be 7.55 cents per pound. Since the gallon of paint weighed 14.8 pounds and contained 58 per cent of pigment, a gallon contained 8.584 pounds of pigment and 6.216 pounds of vehicle. The vehicle in this case was linseed oil and a good grade of turpentine drier. The pigment in this gallon of paint would be worth 65 cents (8.584×7.55) and the vehicle 76 cents (6.216×12.25). The total cost of the materials in this paint, therefore, would be \$1.41.

These two paints, as before stated, were bought at the same time and at practically the same price. The prices paid would not be indicative of their value at the present day, since they were bought several years ago, when paint materials were considerably cheaper than they are now; but it is obvious that the margin of profit was very much greater on paint No. 3861 than on No. 3864.

#### Estimated Cost of Colored Paints

Tinted paints, at least those of light tint, consist practically of white paint with the addition of a small amount of coloring matter. The coloring materials used in tinting are not uniform, and it is not possible, therefore, to give exact di-

rections for producing a particular shade, since the amount of color used will depend upon the individual characteristics of the particular lot on hand. In general, gray tints are made from white paints by the addition of a black pigment, such as lampblack or bone black, and sometimes a small amount of red or blue is used also. The total amount of coloring matter employed varies, but rarely amounts to as much as 5 per cent. Buff may be made by the addition of mixtures of ocher and umber; brown by the addition of mixtures of black, red, and sometimes yellow. Yellow and cream may be made by the addition of ocher or throme yellow; frequently for this purpose golden ocher is used, which is ordinary ocher brightened by the addition of a small amount of throme yellow. Blue tints may be made by the addition of small amounts of Prussian blue. This is a powerful tinting pigment, and it is seldom that more than 1 per cent is required. With the white paints which contain no lead, ultramarine blue may be used instead of Prussian blue; but ultramarine blue should not be used with lead paints.

Besides the tinted white paints, bright colors are sometimes desired, especially green, for blinds, and reds for the trimmings of houses or for machinery. These paints seldom contain any large amount of the expensive lead and zinc white pigments, but consist of comparatively small quantities of coloring matter and large amounts of the cheap white pigments. For black paints there is practically only one coloring substance, namely, carbon, which, however, occurs commercially in a number of forms. The color of so-called drop or ivory black is carbon obtained

from charred bone; lampblack is carbon in the form of soot. The latter, altho very pure, does not make a satisfactory black alone, the heavier forms of carbon, such as bone black or even ground charcoal, producing a better black.

(To be continued)

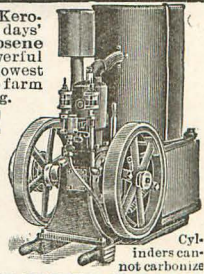
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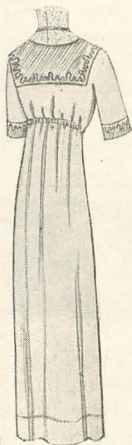
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## Seasonable Receipts

### Eggs

Eggs should never be "boiled" in water at the boiling point or 212 degrees. They should be put into water at 180 or 190 degrees and kept at about that temperature, six minutes for soft "boiled" eggs and ten to twelve minutes for medium hard. about a pint of water should be allowed for each egg. The white will be jelly-like and the yolk soft or firm according to the length of time cooked. Hard "boiled" eggs should be cooked in water at 180 degrees for forty-five to sixty minutes. The white will be hard without being tough and the yolk will be mealy. This makes them nice for salad or for "deviling."

To properly poach eggs, pour boiling water into a shallow pan which has been subdued with oil or butter. Break the eggs, one at a time into a cup or sauce dish and slip carefully into the water which will then be about 185 degrees. Dip a little of the hot water over the egg till a white film forms over the yolk. As soon as the white is firm lift out carefully on a skimmer, trim of ragged edges, if there are any, and place it on a slice of hot, buttered toast. Sprinkle with salt and pepper and serve on hot plates.

Serve poached eggs on thin slices of fried or broiled ham for a change.

Poached eggs served on hot, highly seasoned, boiled rice, are called Spanish Eggs.

Make mounds of about half a cupful of nicely seasoned mashed potato. With a

spoon make a deep dent in the top of each mound, put in a small piece of butter, then break in an egg. Sprinkle with salt and pepper and set in the oven until eggs are cooked and potato slightly browned. Serve with crisp slices of bacon.

### Dried Apple Butter

Cook dried apples until they are tender and free from water. Cool and mash fine then add half as much sugar as there is apple and a little ground cinnamon. Mix well and put in the oven and cook until the desired thickness, stirring every 10 or 15 minutes. This is a pleasing change from the ordinary dried apple sauce.

### Apricots and Prunes

Stew equal portions of apricots and prunes and add a little more sugar than for prunes alone. For a change add a little of your favorite spice.

### Apricot Shortcake

Make shortcake in the usual way using stewed apricots for filling. Serve with a sauce made of the juice slightly thickened and made rich by the addition of a little butter.

### Lemon Filling for Cake or Tarts

Two and two-thirds cupfuls granulated sugar. Juice of three lemons and grated rind of two. One-half cupful fresh butter and 6 eggs.

Boil gently till the consistency of honey. Put in glass jars and when cold tie on cover, but do not put on wax. Will keep well in a dry place.

### Chocolate Pie

One cup of milk, pinch of salt, one and one-half squares of Baker's Chocolate, two level teaspoonfuls of flour, two eggs (yolks), five tablespoonfuls of sugar (level), one teaspoonful of vanilla.

Put milk, salt and chocolate in upper part of the double-boiler, and when hot and smooth, stir in the flour, which has been mixed with enough cold milk to be thin enough to pour into the hot milk. Cook, stirring constantly, until it thickens: then let it cook eight or ten minutes. Mix the eggs and sugar together and pour the hot mixture over them, stirring constantly one minute. Remove, and when cool add one teaspoonful of vanilla.

Bake in a pie tin lined with rich crust, then cover with a meringue made of whites of two eggs, 4 level tablespoonfuls sugar, one teaspoonful vanilla and a pinch of salt.

### Chocolate Fudge

One-half a cup of milk, three level tablespoonfuls of butter, two and one-half cups of powdered sugar, six tablespoonfuls of Baker's Cocoa, pinch of salt, one teaspoonful of vanilla.

Mix all ingredients together but vanilla; cook, stirring constantly, until it begins to boil, then cook slowly, stirring occasionally, eight or ten minutes, or until it makes a firm ball when dropped in cold water. When cooked enough, add the vanilla and beat until it seems like very cold molasses in winter. Pour into a buttered pan; when firm, cut in squares. Great care must be taken not to beat too much, because it cannot be poured into the pan, and will not have a gloss on top.

### Codfish Gravy

If codfish is desired for dinner, soak thoroly in tepid water in the morning; use one tablespoonful of flour to a pint of milk; let milk come to a boil and place in it the codfish, shredded; season well with butter and pepper, if desired; slice hard-boiled eggs into the mixture.


### Meat Jelly

A fine dish of cold meat is made by getting a shank bone or shoulder of veal; cook until meat leaves the bone. Take out bones; pick meat into small pieces. Boil broth down to about 1 pint. Season with salt and pepper, pour boiling broth over it and set on ice to cool.

### Creamed Cabbage

Slice as for cold slaw and stew in covered dish until tender, drain and add 1 cupful cream, a generous lump of butter, salt and pepper to taste. Simmer 2 or 3 minutes and serve.

The crust which forms in the teakettle may be removed by boiling in it for a short time water with a quantity of vinegar or sulphuric acid. Be sure to cleanse the kettle thoroly by washing with hot soda water.



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